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Poverty, Job Quality and Labor Market Dynamics

The Impact of Labor Market Reforms on Informality in Egypt

Jackline Wahba

Population Council

Jackline Wahba is an Associate Professor in Economics at the University of Southampton, Southampton, United Kingdom. Email address: J.Wahba@soton.ac.uk

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Population Council
West Asia and North Africa
59 Misr Helwan Agricultural Road, Maadi, Cairo, Egypt
Tel.: (+202) 2525-5965, (+202) 2525-5967, (+202) 2525-5968
Facsimile: (+202) 2525-5962
Email: pcouncil@popcouncil.org http://www.popcouncil.org

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Abstract

This paper examines the effect of the new labor law of 2003, which provides flexibility in the hiring and firing procedures since labor market inflexibility was seen as one of the obstacles to job creation in Egypt. The analysis focuses on the effect of the new law on formal employment (jobs with contracts) in the private non-agricultural regular waged sector. The findings suggest that the new law has had a positive impact on those who were employed in 1998 in the private non-agricultural sector and in the private non-agricultural waged sector. However, the effect was not significant for new entrants to the labor market looking for first jobs.

1. Introduction

Egypt has undergone a number of economic reform measures since the early 1990s, with the aim of liberalizing the economy and moving toward a market economy. As a result, among other measures, the Egyptian government has introduced a new labor law (No. 12) with the goal of increasing flexibility in the labor market. Law 12, which came in effect in July 2003, provides comprehensive guidelines for the recruitment, hiring, compensation, and termination of employees. In particular, it provides increased flexibility for firms in the hiring/firing process, which has been a major bottleneck for job creation in the Egyptian labor market.

The introduction of the new labor law in Egypt provides us with an opportunity to study the impact of regulations that aim to provide more flexibility in the labor market. Indeed, there is a wide disagreement among economists on the benefits of labor market regulations and on the impact of labor market flexibility on employment in particular. Some economists believe that unregulated labor markets are superior to regulated ones. On the other hand, others argue that regulations are needed to protect poor and vulnerable workers.[1] Given the change in the law, this paper examines the effect of introducing more flexible employment protection legislation in Egypt.

This paper will explore the following issues: What is the effect of the new labor law on informalization? Does the introduction of more flexible

1 See Freeman (1993) for a summary of this debate.

labor codes that facilitate the hiring/firing process lead to an increase in formal employment? This is an important issue for developing countries, like Egypt, where the informal sector has been growing recently and has become the main employer in the economy. Yet informal employment tends to be of low quality with no job security and no social security coverage. From a policy perspective, it is essential to investigate whether a more flexible labor market would encourage the growth of the private formal sector leading to more protected jobs.

The structure of the paper will be as follows. Section 2 will review the previous literature dealing with labor market regulations and focus on the effect of employment protection regulations. Section 3 will discuss Egypt's Labor Law no. 12 and its aims. Section 4 will examine what has happened to informalization in Egypt in general and then whether the new labor law has had any impact on informal employment. Section 5 will go beyond descriptive analysis to test for the impact of the new labor law for different groups of workers. Section 6 concludes.

2. Literature Review

The functioning of labor markets depends on institutions and regulations. For example, labor market regulations can affect the rate of job creation and destruction, the levels of employment and unemployment in the economy, and the degree of social protection provided to workers. However, there is wide disagreement among economists on the benefits of labor market regulations. Some economists believe that unregulated labor markets are superior to regulated ones; i.e. more efficient. They argue that labor market regulations introduce distortions that misallocate labor; waste resources through rent seeking, impede adjustments to economic shocks, discourage hiring, and favor "insiders" (such as regular workers, or males) and therefore reduce growth. Freeman (1993) refers to that view as the "distortionist." On the other hand, some believe that due to market failure and the ensuing injustice and inequity, regulations are needed to protect poor and vulnerable workers. This is referred to as the "institutionalist" view.[2]

There are various forms of labor regulations. In general, labor market regulations are introduced with the objective of protecting workers from

2 See Freeman (1993) for a summary of this debate.

uninsurable labor market risk, such as *employment* risk, or from *earnings* risk. To improve the earnings of the most disadvantaged categories of workers, governments typically set minimum wages; they might also mandate that employers provide non-wage benefits to their workers, such as healthcare, paid vacations, maternity leave, etc. To protect workers from employment risk, governments can decide to protect existing jobs by restricting the ability of firms to lay off employees at will and/or provide unemployment insurance to those who lose their job. (Boeri et al. 2008)

In this paper, the focus is on one particular set of labor market regulations namely employment protection, or job security, rules that refer to hiring and firing arrangements. These can cover what kinds of contracts are allowed, the conditions under which workers can be terminated, requirements for severance and advance notice of termination, redundancy procedures, and special rules for mass layoffs.

The degree to which employment protection rules are rigid or flexible can affect labor market outcomes including employment levels, labor dynamics (i.e. employment fluctuations), and the composition of employment. Rigid employment rules are expected to lengthen job tenure and reduce labor turnover, protecting the jobs of incumbent employees and limiting hiring opportunities. At the same time, rigid job security rules affect the composition of employment by shifting labor to uncovered (informal) sectors or employment types. Obviously, the effectiveness of labor regulation will depend on the extent to which those regulations are enforced.

Betcherman et al (2001) summarize the theoretical impact of strict termination rules as follows: lower labor turnover rates (hirings plus separations); lower aggregate employment levels; greater numbers of long-tenure jobs; lower labor force participation rates; no clear impact on unemployment levels, but longer average unemployment durations; at a macro level, slower recovery from an aggregate shock; more self-employment as a share of total employment; more non-standard employment (e.g., part-time or temporary); positive employment effects for skilled prime-age males but lower employment for women, young people, and less-skilled workers. They add that the empirical findings are strongest for the dynamic effects—on turnover and tenure and flows between employment and unemployment and in terms of who benefits from employment protection rules and who does not. For example, in Latin America there is evidence of negative employment effects of job security rules.

In the last two decades or so, there has been a move toward labor market flexibility and many countries introduced labor market reforms to

enhance productivity, competition, and to accelerate employment generation and improve economic performance. Yet the empirical evidence on the effects of labor flexibility is mixed.

The main empirical evidence on the effect of labor market flexibility has focused mainly on developed countries but have more recently included studies on less-developed countries (LDCs). The focus of the studies on DCs has been on whether excessively strict employment protection law has been an important contributor to the persistently high unemployment experienced in many countries that are part of the Organisation for Economic Co-operation and Development (OECD). However, the empirical research has not provided a clear-cut answer. Early on, Lazear (1990), using data on severance pay and periods of notice required before employment termination for 22 developed countries for the period 1956–84, found some evidence that they have a negative relationship with the employment rate and a positive one with the unemployment rate.

Di Tella and MacCulloch (2005), using a new data set on hiring and firing restrictions for 21 OECD countries for the period 1984–90 based on surveys of business people in the countries covered, controlling for country and time fixed effects, and adopting dynamic panel data techniques, found evidence that increasing the flexibility of the labor market increases both the employment rate and the rate of participation in the labor force. There is also some evidence that more flexibility leads to lower unemployment rates and to lower rates of long-term unemployment. They also found evidence consistent with the hypothesis that inflexible labor markets produce "jobless recoveries" and introduce more unemployment persistence.

As argued by Boeri et al. (2008), developing countries are often fundamentally different from developed economies. Poorer countries tend to have stricter labor regulations compared to richer countries, even though they offer less social protection. At the same time, rigid labor regulation is associated with a larger informal sector that is associated with worse working conditions and poor job "quality" (Boeri et al. [2008]). Developing countries are often characterized by weak law enforcement, a large informal sector, underdeveloped capital markets, and informal credit and insurance networks. Ignoring these features when studying developing economies can be problematic.

According to the World Bank in *Doing Business 2009*, developing countries tend to mistakenly go to the extreme of rigid regulations, pushing employers and workers into the informal sector. Overly rigid regulations may have undesirable effects such as less job creation, smaller company

size, less investment in research and development, and longer spells of unemployment and thus the obsolescence of skills, all of which may reduce productivity growth. Hence excessive rigidity can be to the detriment of businesses and workers alike.

Recent studies have examined the effect of labor market regulations and labor market flexibility in developing countries. For example, Kingdon et al. (2006) argue that the failure of African labor markets to create good paying jobs was the result of lack of labor market "flexibility" keeping formal sector wages above their equilibrium level and restricting job creation. This has resulted in excess labor supply in the form of either open unemployment or a growing self-employment sector.

Besley and Burgess (2004) examine the link between regulation and long-term development in India by looking at state amendments to the Industrial Disputes Act of 1947. Their empirical evidence suggests that labor regulation is a key factor in the pattern of manufacturing development in India. Regulating in a pro-worker direction was associated with lower levels of investment, employment, productivity and output in registered manufacturing. It also increased informal sector activity.

Kugler (2004) examines impact of the Colombian labor market reform of 1990 which substantially reduced the costs of dismissing workers through the reduction of severance payments on unemployment. Using micro-level data from Colombia, she finds that those reforms contributed to 10% of the reduction in unemployment during the period of study.

In the next section, the changes in labor regulations in Egypt are described first before examining the impact of those employment protection reforms on informal/formal employment.

3. The New Labor Law

The Egyptian government introduced a new labor law (No.12) in 2003. The new law provides comprehensive guidelines for the recruitment, hiring, compensation, and termination of employees. The law comprises 257 articles that address all the legal aspects regulating the Egyptian labor market. The law aims to increase private sector involvement and at the same time achieve a balance between employees' and employers' rights.

Among the most important issues that the new law addresses is the right of an employer to fire an employee and the conditions pertaining to this, as well as granting employees the right to carry out a peaceful strike according

to controls and procedures prescribed in the new law. In particular, the new law provides increased flexibility for firms in the hiring/firing process, which has been a major bottleneck for job creation in the Egyptian labor market.

The new labor law allows private sector employers to renew a temporary contract without transforming it automatically into a permanent employment status as was stated in the preceding law. Also, under the new regulation, employers can terminate a contract more easily and lay offs can be justified by difficult economic conditions. In return, workers that have been dismissed have the right to appeal. However, this law does not apply to public servants of state agencies, including local government units and public authorities, nor to self-employed workers.

Until July 2003, when the new labor law was enforced, existing legislation had been rather stringent both for workers and for employers. It prohibited employers from terminating the contract of a worker after a probation period. In addition, employers were not allowed to recruit workers directly but through local employment offices.

Thus, given the new labor regulations, it seems important to examine the effect of the new labor on employment, in particular on informal employment. Theoretically, one would expect the new law to enable employers to hire and fire workers more easily and hence to enable them to hire more workers formally. In the following section we test the hypothesis that the introduction of the new labor law has led to more formal private employment.

4. What Has Happened to Informalization?

4.1 Data

The analysis in this paper will be based on Egypt Labor Market Panel Survey of 2006 (ELMPS06) which is a follow-up survey to Egypt Labor Market Survey of 1998 (ELMS98). Both surveys carried out by the Economic Research Forum (ERF) in cooperation with the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS)—the main statistical agency of the Egyptian government. The ELMPS06 is the second round of what is intended to be a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households and individuals interviewed in 1998, any new households that might have formed as a result of splits from the original households, as well as

a refresher sample of households to ensure that the data continue to be nationally representative.

The fieldwork for ELMPS06 was carried out from January to March 2006. The final sample of 8,349 households is made up of 3,684 households from the original ELMS98 survey, 2,167 new households that emerged from these households as a result of splits, and a refresher sample of 2,498 households. Of the 23,997 individuals interviewed in 1998, 17,357 (72%) were successfully re-interviewed in 2006, forming a panel that is used for our analysis. The attrition that occurred in the original 1998 sample was mostly random in nature since it resulted from the loss of records containing identifying information for the 1998 households at CAPMAS. Of the 1,115 households that could not be re-interviewed, 615 are due to loss of records and the remainder is made up of expected losses due to total relocation of the household, death of all household members, or refusal to participate in the survey.[3] The questionnaire for the ELMPS06 is closely based on that used in the ELMS98 to ensure comparability of the data over time.

The surveys provide a rich source of information on labor market conditions of individuals. The surveys collect information on the characteristics of jobs such as on the presence of legal job contract and social security coverage. The paper will make use of the panel nature of ELMPS06 and of data on the characteristics of first jobs, as well as of the rich retrospective information on previous employment characteristics.

4.2 Informality Patterns and Trends

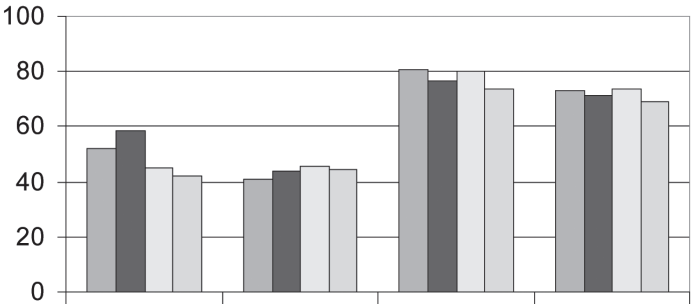
First, examining informality trends between 1998 and 2006 provides an interesting picture (Fig. 1). Looking at informality defined as lack of job contract *and* lack of social security suggests that informality has increased between 1998 and 2006 as a share of total employment and as a share of non-agriculture employment. However, limiting the scope to private non-agriculture waged employment the share of informality has declined over this period.

Measuring informality as lack of job contract *only* also provides a similar pattern. In 2006, 69% of private non-agricultural regular waged workers had no job contracts, down from 74% in 1998, thus suggesting that the decline in informality among private non-agriculture employment is due

3 For more details, see Barsoum (2006).

to more workers holding job contracts and not to do with social security, which is what one would expect if the new labor law has had an impact.

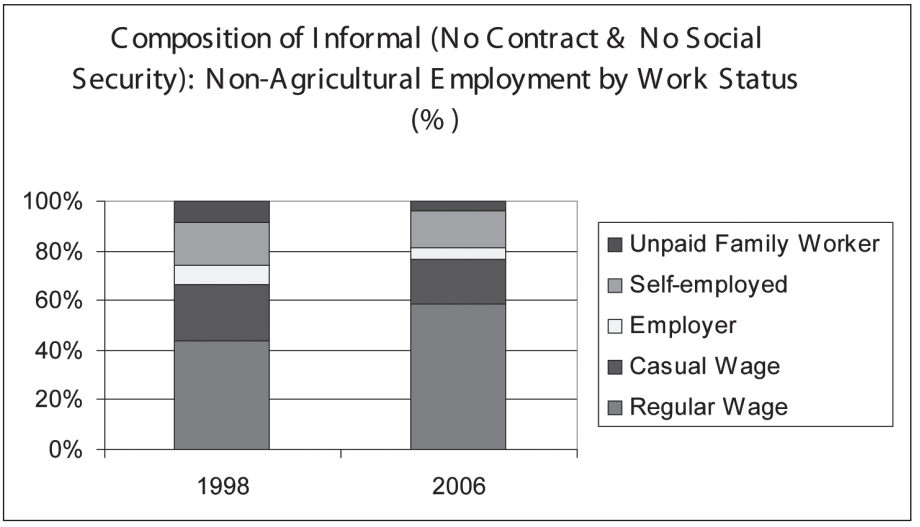
Figure 1: Proportion of Informal Employment



	All workers	Non-Agric	Private, Non-Agric waged	Private, Non-Agric, regular waged
No Contract, No Social Security 1998	52.3	40.89	80.51	73.31
No Contract, No Social Security 2006	58.39	43.93	76.33	71.19
No Contract 1998	44.81	45.56	80.01	73.66
No Contract 2006	42.07	44.5	73.93	69.07

Public sector employees tend to be protected: they hold job contracts and have social security coverage, in addition to other benefits. The agricultural sector is typically excluded from the informal sector since it has its own features: subsistence, family work, etc. Thus, the sector that is of interest to us is the private non-agricultural sector. Examining the composition of the non-agricultural informal employment, the evidence suggests a change between 1998 and 2006. As Figure 2 shows, the proportion of regular waged workers has increased by almost 15 percentage points and amounted to almost 60% in 2006. At the same time, the share of casual waged workers has also declined. Meanwhile the share of unpaid family workers also fell over this time period. This suggests that informal employment is increasingly becoming dominated by regular waged work and not self-employment or employers.

Figure 2: Composition of Informal (No Contract & No Social Security): Non-Agricultural Employment by Work Status



Given that the change in the labor law applies only to the private (non-agricultural) sector and that only waged workers may hold contracts (i.e. self-employed workers and employers do not hold job contracts), the focus of this paper will be on private non-agricultural regular waged work. Regular work includes both permanent and temporary, but excludes seasonal and intermittent. The aim of the paper is to test whether the new labor law affected the proportion of job contract holders among the private non-agricultural regular waged workers (PNARW) in 2006. For the rest of the paper, informality refers to lack of job contract while formality refers to holding a job contract.

An important issue is whether the increase in job contract holders increased as a result of the law. Figure 3 shows the proportion of jobs with contracts that started between 1998 and 2006. There is no evidence that the new labor law has had an effect on the proportion of jobs with contracts in PNARW (Fig. 3). However, limiting the analysis to those who were private non-agricultural regular waged workers in 1998 (PNARW98; Fig. 4a), the fitted trend line shows a positive trend suggesting that there has been an increase in formality (job contract holding) between 1998 and 2006 among PNARW workers. A similar pattern emerges if the analysis is confined to those who were in private non-agricultural employment (waged and non-waged) in 1998—Fig. 4b. This indicates that among those were already employed in private non-agricultural sector there is evidence

that the labor law has had a positive impact on the likelihood of holding job contract in 2006. At the same time this suggests that the new entrants might be the ones who were not affected by the new labor law, an issue we investigate further below.

Figure 3: Proportion of Jobs with Contract by Year of Job Start

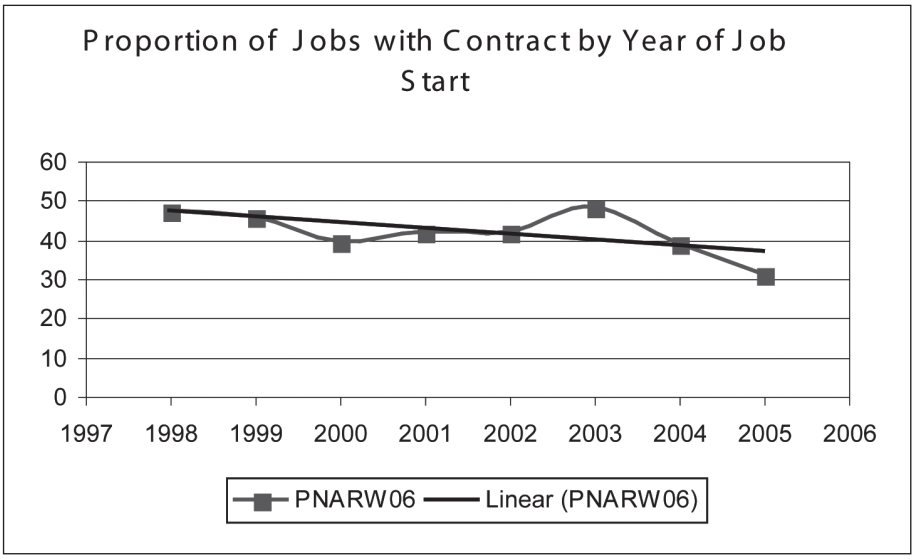


Figure 4a: Proportion of Jobs with Contract by Year of Job Start

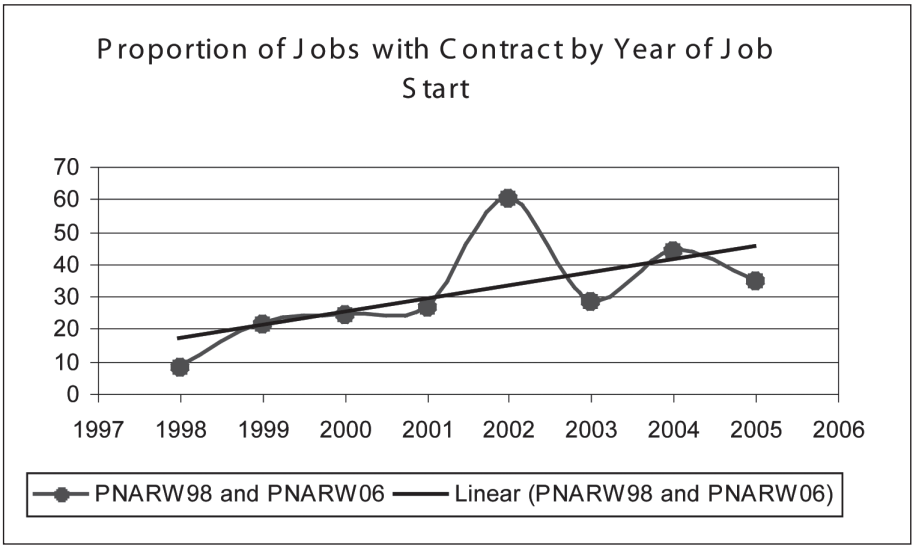
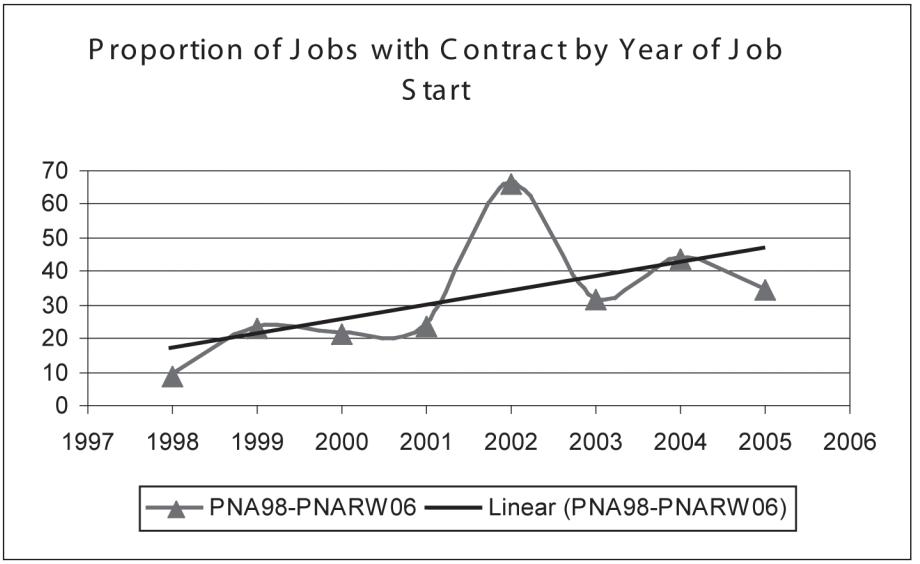
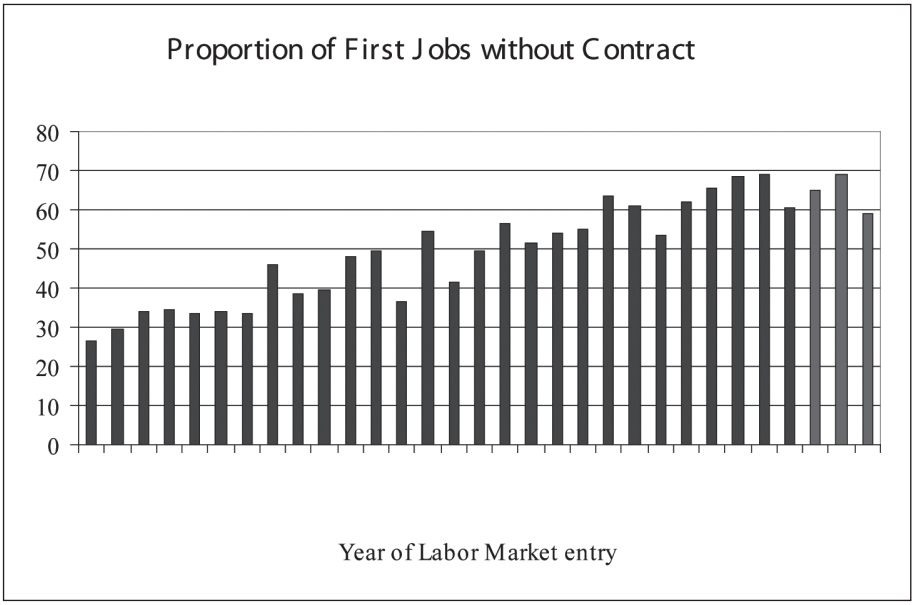


Figure 4b: Proportion of Jobs with Contract by Year of Job Start



Over the last three decades, new entrants to the labor market have become increasingly likely to start their careers in the informal sector. Moktar and Wahba (2000) have found that in the early 1970s, 20% of workers used to start their working life with informal jobs, but by 1998, 69% of new workers have started in informal employment. Figure 5 shows the proportion of first jobs without contracts between 1975 and 2005. There has been an increase in the trend of first jobs of those aged 18–45 years of age being not protected by contracts over the whole period. This might explain why in Fig. 3, when we examine all jobs that started between 1998 and 2006, we don't find a positive trend since new entrants (first jobs) are included.

Figure 5: Proportion of First Jobs without Contract



4.3 Transition to PNARW Jobs with Contracts

Next we examine the rate of transition for different types of workers between 1998 and 2006 and limit the analysis to those who were aged 20–50 years old in 1998. As seen in Table 1, around 8% of workers who were engaged in informal private non-agricultural employment (PNA) have become formal private non-agricultural regular waged (PNARW) workers in 2006. Also, 7% of workers who were informal PNAW in 1998 became formal PNARW by 2006. Finally among those who were notPNAW in 1998, 4% acquired job contracts by 2006. This last group (notPNAW) includes those where not working in 1998, such as students and housewives, non-waged workers, agricultural workers, and public sector workers in 1998, but who were working in 2006.

Table 1: Transition Matrices

	Private Non-Agriculture Regular Waged Work (PNARW) in 2006		
	Job Contract 2006	No Job Contract 2006	Total
Private Non-Agriculture Employment (PNA) in 1998			
Job Contract 1998	93.99	6.01	100 (33.21)
No Job Contract 1998	8.14	91.86	100 (66.79)
Total	36.66	63.34	100 (100)

	Private Non-Agriculture Regular Waged Work (PNARW) in 2006		
	Job Contract 2006	No Job Contract 2006	Total
Private Non-Agriculture Waged Work (PNAW) in 1998			
Job Contract 1998	93.99	6.01	100 (34.43)
No Job Contract 1998	7.35	92.65	100 (65.57)
Total	37.18	62.82	100 (100)

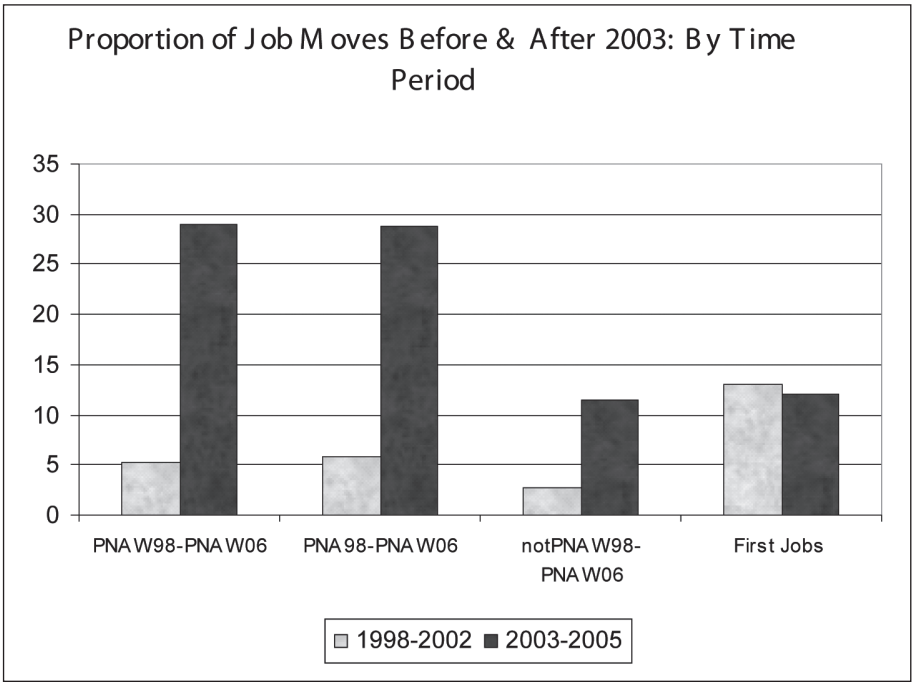
	Private Non-Agriculture Regular Waged Work (PNARW) in 2006		
	Job Contract 2006	No Job Contract 2006	Total
Not Private Non-Agriculture Waged Work (notPNAW) in 1998			
Job Contract 1998	97.88	2.12	100 (53.02)
No Job Contract 1998	4.22	95.78	100 (46.98)
Total	53.88	46.12	100 (100)

Notes: Figures in parentheses are the column sum in percent.

Table A1 provides the transition rate to formal PNARW before and after 2003, the year the law was introduced. Almost 34% of movers between informal PNAW98 and formal PNARW06 moved between 2003–05. However, 5% of the moves between 1998–2002 were moves from PNAW98 to PNARW06 compared to 29% between 2003–05 as illustrated in Fig. 6.

Similar patterns are observed for moves between PNA98–PNARW06 and notPNAW98–PNARW06 suggesting that the proportion of moves to PNARW was higher between 2003–05 than between 1998–2002, supporting the hypothesis that the new labor law has had a positive impact on formal employment among employed workers. However, there doesn't seem to be an impact for first jobs.

Figure 6: Proportion of Job Moves Before & After 2003: By Time Period



A striking, yet unsurprising, aspect of the characteristics of informal workers in 1998 that became formal by 2006, i.e. movers, is that they are predominantly male. The transition rates for females to PNARW in 2006 are very low at around 2% if they were employed in 1998 and less than 1% for those who were notPNAW workers in 1998 (Fig. 7). The fundamental problem is that very few women are employed, as a proportion of working women, in the private non-agricultural waged sector. This has been highlighted in previous studies; see for example Wahba (2009) and Assaad (2007).

Another important dimension of transition to formal PNARW in 2006 is education. Those with university degrees who were employed in 1998 with no contract had 16% probability of holding a contract in 2006 compared to around 3% among the illiterates (Fig. 8). There is clear evidence

that education affects the transition rates from informal jobs to formal ones. This is consistent with Wahba (2009) who, using evidence from the ELMPS06, and controlling for selectivity into informal jobs, finds that the mobility from informal to semi-formal/formal employment is highly segmented along education and gender. She concludes that informal employment is a stepping stone for highly educated male workers, but is a dead end for the uneducated, and for female workers.

Figure 7: Transitional Rates by Gender

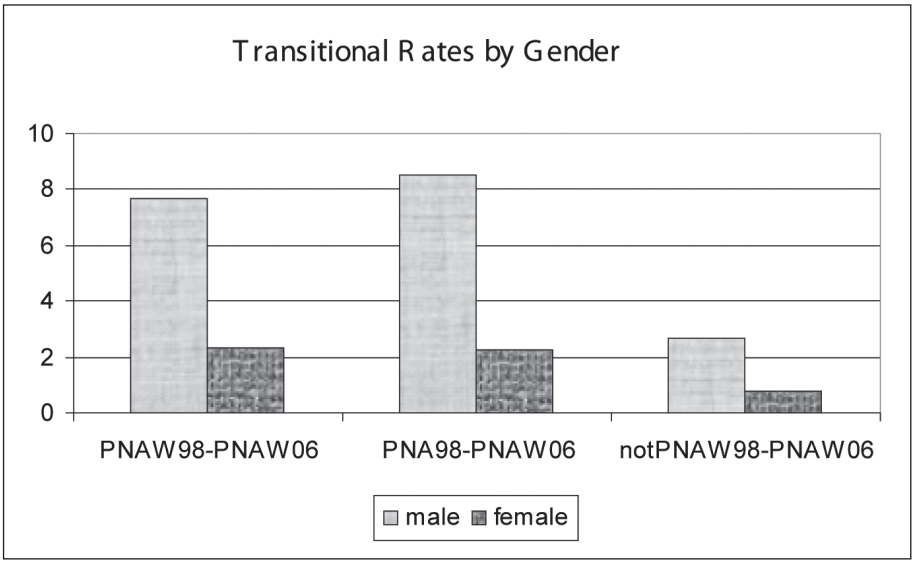
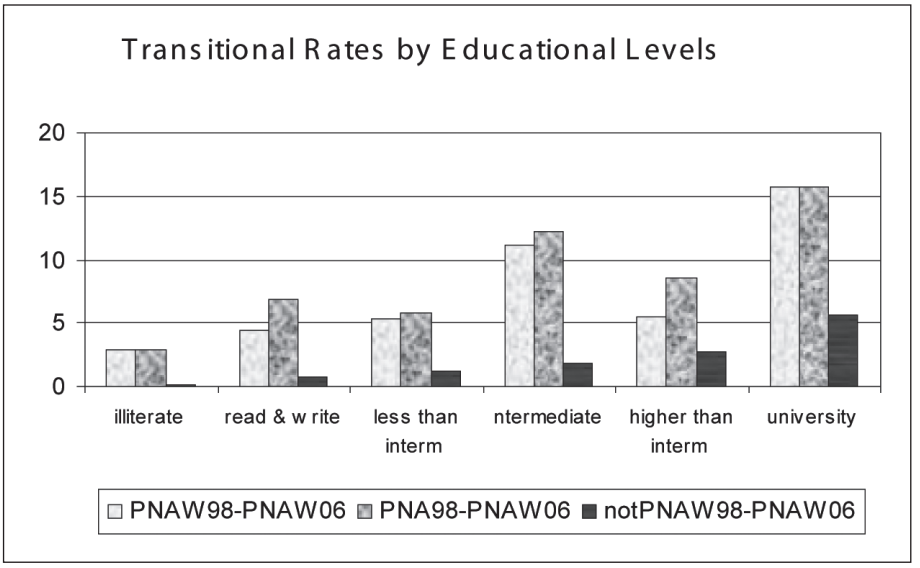


Figure 8: Transitional Rates by Educational Levels



Characteristics of Movers

Table 2 presents the characteristics of movers distinguished by their original type of employment in 1998. We study three types of workers as before who ended up in formal PNARW jobs in 2006. First, gender clearly plays an important role with the great majority of movers being males. Movers tend to be around two years younger on average to non-movers, although movers from notPNAW98 tend to be much younger than non-movers. As seen above, but here looking at the educational distribution of movers and non-movers, it is clear that movers on the whole are more educated than non-movers. Almost 58% of movers from PNAW98 or PNA98 have at least intermediate degrees. This is even more intensified among movers from not-PNAW98 were 57% have university degrees. There is also some indication that the distribution of movers is not even across regions. Looking at the region of employment in 1998, more workers move in Alexandria and the canal cities and fewer in Lower (urban and rural) Egypt. Movers also tend to have about 5 years shorter job tenures than non-movers. Examining the occupations in 1998 shows that professionals are the most likely to move, which is not surprising given that professionals tend be on average better educated. However, it has to be noted that this is not reflected for those who were notPNAW98. One has to be cautious in interpreting too much into that given that this category includes those who were not working and

therefore will not have a profession in 1998. Finally, family background does matter: movers tend to have on average better educated fathers, reflected in fewer movers having illiterate fathers. Moreover, more movers tend to have fathers who were white collar workers than non-movers.

Table 2: Movers to Formal PNARW Jobs: 1998–2006

	PNA98 & PNARW06		PNAW98 & PNARW06		notPNAW98 & PNARW06	
Variable	Movers	All	Movers	All	Movers	All
Individual Characteristics						
Male (%)	98.04	94.46	98.28	94.62	80.49	57.48
Age (in 1998)						
Age in years	26.8	28.9	27.3	29.0	24.8	33.6
20–29 old %	78.43	61.93	75.86	61.91	86.18	36.92
30–39 old %	19.61	26.14	18.97	26.11	8.13	34.04
40–49 old %	1.96	10.65	5.17	10.77	5.69	27.23
Education %						
None	7.84	22.73	6.90	22.48	1.63	31.65
Reads & writes	7.84	11.93	8.62	11.84	2.44	6.37
Less then intermediate	17.65	26.56	17.24	26.24	7.32	11.14
Intermediate	49.02	29.12	50.00	30.01	22.76	26.01
Higher than intermediate	3.92	3.84	5.17	3.90	8.13	4.83
University	13.73	5.82	12.07	5.52	57.72	20.01
Job Characteristics in 1998						
Job Region in 1998 %						
Greater Cairo	19.61	18.32	18.97	18.03	2.44	9.41
Alex.& Canal Cities	23.53	12.36	20.69	11.98	8.13	6.90
Lower Urban	11.76	17.19	10.34	16.69	3.25	11.74
Upper Urban	15.69	11.22	13.79	11.57	5.69	13.87
Lower Rural	5.88	11.79	12.07	12.65	7.32	13.54
Upper Rural	3.92	4.97	3.45	5.25	2.44	13.03
Tenure before 98 (years)	8.25	13.31	8.91	13.34	4.33	15.15

continued ▶

Occupation in 1998, %						
Legislators, senior officials & managers	3.92	0.99	5.17	2.02	1.63	7.69
Professionals	11.76	2.84	10.34	2.69	4.07	15.54
Technicians & associate professionals	1.96	2.27	1.72	2.56	2.44	9.90
Clerks	0.00	1.70	0.00	1.62	1.63	4.80
Service & shop/ market sales workers	25.49	20.03	24.14	19.38	2.44	7.46
Skilled agricultural & fishery workers	5.88	1.70	6.90	2.56	8.13	16.47
Craft & related trades workers	29.41	43.47	29.31	42.80	4.88	6.68
Plant & machine operators and assemblers	15.69	19.89	17.24	19.25	4.88	2.85
Elementary occupations	5.88	6.96	5.17	7.00	1.63	1.49
Father's characteristics %						
Illiterate	33.33	59.09	32.76	59.08	23.58	54.16
White collar	31.37	19.18	32.76	19.52	47.97	25.21

Given the different nature and patterns of first jobs, Table 3 examines that group separately. Those are the characteristics of individuals aged between 18 and 45 years of age,[4] whose first job started between 1998 and 2006. We also distinguish between all first jobs and PNAW first jobs. Comparing the characteristics of those who have had formal PNARW first jobs, similar patterns are observed as in Table 2. A couple of interesting differences are: first, those who managed to secure formal PNARW first jobs tend to be on average slightly older than those who haven't, and 37% of them tend to be located in Greater Cairo.

4 This age bracket seems to be reasonable to consider for first jobs. Including 15–18 years old distorts the results since those are least likely to have a formal job. Several sensitivity analyses were conducted using 20–45 and 18–40 age brackets and the results were robust.

Table 3: Formal PNARW First Jobs in 2006

	All First Jobs	PNAW First Jobs	Formal PNARW06
% Jobs Started 2003–05	38.49	37.35	36.80
Individual Characteristics			
Male %	70.59	76.50	77.19
Age (in years at time of LM entry)	22.15	21.94	23.23
Educational Levels %			
None	8.08	1.72	0.35
Reads & writes	1.16	0.88	0.33
Less then intermediate	5.48	4.61	4.16
Intermediate	52.67	48.62	23.56
Higher than intermediate	5.50	6.30	7.22
University	27.12	37.87	64.39
Job Regions in 1998 %			
Greater Cairo	18.86	30.63	37.14
Alex. & Canal Cities	9.92	13.19	16.65
Lower Urban	13.91	17.00	11.81
Upper Urban	13.53	17.76	25.02
Lower Rural	17.03	9.13	1.12
Upper Rural	15.97	3.17	1.55
Father's characteristics %			
White collar	26.04	30.94	49.12
Illiterate	41.25	34.22	19.24

Overall, the descriptive statistics suggest that the new labor law has had an impact on informal employment among those already employed but not among new entrants to the labor market. One potential explanation is that employers do not formalize the employment status of new workers who have just started their working careers. In the next sections, we explore the extent to which the findings so far can be attributed to the new labor law once the characteristics of individuals, jobs, and regions are controlled for.

5. Empirical Analysis: The Effect of the Labor Law

5.1 Probability of Formal Jobs and the Labor Law

First, to study the effect of the new labor law on job contract holding, the probability of workers moving to a formal (i.e. protected by job contract) PNARW job is estimated distinguishing between before and after the new law.

First, we model the probability of a worker having a formal PNARW job in 2006 not having one in 1998. Let the latent variable y* represent the decision to have a formal PNARW job. We do not observe the decision, only whether it is made or not.

$$y_{is}^{*} = X\beta + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Therefore, we define y = 1 if the worker has moved to a formal PNARW job and 0 otherwise.

$$y_{is} = 1 \quad \text{if } y^{*} > 0,$$

$$y_{is} = 0 \quad \text{if } y^{*} \leq 0$$

We assume that the disturbances are normally distributed with mean zero and unit variance and estimate the equation using probit function where X is a set of explanatory variables, β is a set of corresponding coefficients and Φ (.) is the cumulative standard distribution.

$$P(y_{is} = 1 \mid X\beta) = \Phi(X\beta)$$

The probability of a worker *i* originally in state *s* moving to a formal PNARW job in 2006 is estimated where *s* =1, 2, 3; 1= informal PNAW job in 1998; 2= informal PNA job in 1998; 3= notPNAW in 1998 (no restriction on contract in 1998 is imposed). This group, *s*=3, includes those who were not working in 1998, i.e. students, housewives, unemployed but not retired or disabled persons, agricultural workers, non-waged workers (self-employed and employers) and public sector work as long as those individuals were working in 2006 and were not originally PNAW workers in 1998.

To examine the effect of the new labor law a dummy for 2003–05 is used since the law was introduced in July 2003.[5] The public sector has played a major role in the Egyptian labor market since the 1950s with the guaranteed civil-service employment for graduates of secondary and higher educational institutions. Since 1991, the Egyptian government embarked on various economic reforms and downsizing the public sector was one of them. According to Assaad (2007) employment in state-owned enterprises (SOEs) started to decline in the 1988–98 decade, but employment in government was still growing rapidly during that period at about twice the rate of the growth of overall employment. This has changed in 1998–2006 when employment growth in the civil service has slowed dramatically. The public sector has been the preferred sector of employment for many new entrants to the labor market, particularly women. Although the government has slowed down its hiring, it is still the case that the public sector plays a major role in individuals' choices. To capture this, we use the growth in public sector employment, as a proportion of total employment, by governorate between1998–2006.[6] For individuals who were working in 1998 (s =1,2) this is based on the governorate of work location in 1998. For s =3, this is based on the governorate of residence in 1998 rather than work since this group includes individuals who were not working in 1998.

We also control for job characteristics by including years of tenure before 1998 to capture the length of work experience. Job occupation in 1998 is also included, in particular whether the worker's occupation was professional work in 1998. Given the regional variation, regional dummies are included for the six main regions in Egypt. For s=3, we control for the various "working status" in 1998 by including self employment, unpaid family work, and housewives as covariates.

Individual characteristics are also captured using male dummy, three age groups: 20–29, 30–29, and 40–49 years old. We restrict our analysis to those aged 20–50 years of age in 1998. Also, educational level is controlled for using six dummies. Finally, we control for family background, we use father's characteristics: if father is illiterate and if father was white collar worker when the individual was 15 years of age.

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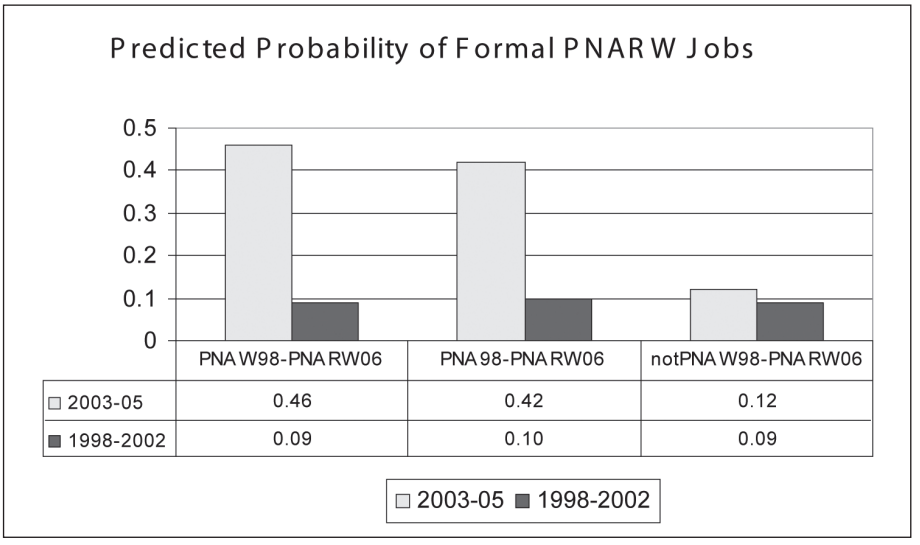
5 Jobs that started in 2006 were excluded since there are very few observations pertaining to 2006, the year of the survey. However, robustness checks were undertaken whereby including 2006 and the findings were unaltered.

6 Source: Egypt Human Development Report, various issues.

Tables A2–A5 present the marginal effects. First, the effect of the labor law on the probability of moving to formal PNARW job overall is positive and significant indicating that the new labor law has had a positive impact on formal employment. The predicted probability of moving from informal to formal PNARW has increased in 2003–05 relative to 1998–2002 as figure 9 shows. The predicted probability of an informal worker moving from PNAW employment into formal PNARW job increased from 9% to 46% after the law for a reference worker.[7] The predicted probability of an unprotected worker moving from PNA employment into protected PNARW job increased from 10% to 42% after the law for a reference worker. Finally, the predicted probability for a notPNAW in 1998 moving into formal PNARW job increased from 9% to 12% in 2003–05.[8]

Figure 9: Predicted Probability of Formal PNARW Jobs



Moving on to the other determinants of moving to protected employment, a number of factors play a significant role. First, and foremost the growth of public sector employment has a negative impact on moving into formal PNARW jobs, suggesting that workers still ranked the public sector

7 Reference person for PNA98–PNARW06 and PNAW98–PNARW06: male, 20–29 years of age, worked in Greater Cairo in 1998, father is not illiterate and is white collar worker.

8 Reference person for notPNAW98–PNARW06: male, 20–29 years of age, lives in urban areas, not self employed, not housewife, not unpaid family worker in 1998, father is not illiterate and is white collar worker.

as their preferred employment: in governorates where the public sector grew, the likelihood of workers moving into the private formal sector was lower.

As for individual characteristics, males were more likely to move to formal job. Although there was a negative relationship between age and mobility into formal jobs, this relationship was only significant for those who originated in notPNAW. The effect of education was not very strong after controlling for the public sector. Professional workers were more likely to move to protected jobs relative to other occupations. Duration of job tenure prior to 1998 seems to reduce the likelihood of moving although was not always significant. For those who were notPNAW in 1998, housewives, unpaid family workers, self-employed workers, all tend to be less likely than waged workers to move into formal employment. Family background matters: an illiterate father or a non-white collar worker reduce the probability of transition into protected jobs.[9]

The Probability of Formal PNARW First Jobs

Given our interest in the effect of the labor law on new entrants to the labor market, we examine this by estimating a binary probit model of the probability of a new entrant between 1998 and 2006 having a formal (contract) PNARW first job.

We use the same controls used above with the exception of job characteristics, which do not apply since those individuals were not working in 1998. To examine the effect of the new labor law a dummy for 2003–05 is used, but also year dummies were used, but were not significant, and are thus not reported. To capture the effect of public sector employment, the governorate of residence of the individual in 1998 is used. We limit our analysis to those aged 18–45 at the time of the first job, and use age in years at the time of first entry to the labor market.

As Table A6 shows, the labor law has had no significant impact for securing protected first jobs. In fact, the predicted probability of a formal private non-agricultural regular waged first job was around 30% before and after 2003. There is also evidence of the importance of the growth of public sector employment which has a negative impact on workers getting formal PNARW first jobs as found above. As for individual characteristics,

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9 Father's education and occupation tend to be correlated. In addition, father's education is sometimes correlated to the worker's education level. Hence the tables provide various experiments to show the potential influence of those covariates.

there is a negative relationship between age and getting a formal first job in PNARW sector. The effect of education is stronger here, with the educated being more likely to secure a protected first job relative to the uneducated.

This is consistent with section 4, where the descriptive statistics revealed that the labor law did not really affect employment of new entrants to the labor market. To analyze the effect of the labor law further, the next sub-section studies the hazard rates into formal jobs before and after the law came into effect.

5.2 Hazard Rates into PNARW

This sub-section examines the impact of the new labor law on the hazard rates of exits into formal PNARW employment. The hazard function is the product of two probabilities: the probability of receiving a job offer and the probability of accepting the job offer. We estimate a reduced form model where the total effects of the variables on exiting into protected PNARW employment is estimated rather than their separate effects on the two probabilities.[10]

Given the nature of the data, durations are grouped into a discrete time interval (years). We measure the duration from 1998 till the time of exit or till 2006 which is the time of the survey (right censored). So, we estimate the probability of exiting to protected PNARW employment in a discrete time framework. In addition, we take account of unobserved heterogeneity. Based on Jenkins (2004), we estimate by maximum likelihood a discrete time (grouped duration data) proportional hazards regression model: (1) the Prentice-Gloeckler (1978) model; and (2) the Prentice-Gloeckler (1978) model incorporating a gamma mixture distribution to summarize unobserved individual heterogeneity, as proposed by Meyer (1990). We chose a piece-wise specification to capture the effect of the labor law. We've also experimented with non-parametric specification using year dummies. For further details on the PGH models, see Jenkins (2004).

In model 1, the discrete time hazard rate for person *i* in the time interval *j* to exit to a formal PNARW employment can be written as:

$$h_j\left(X_{ij}\right) = 1 - \exp\left\{-\exp\left[X_{ij}'\beta + \theta(t)\right]\right\} \quad \text{..... (2)}$$

10 Jenkins (2004).

where X_{ij} is a set of covariates, β are the coefficients to be estimated, and $\theta(t)$ is the functional form of how the duration of the spell affects the hazard rate.

Model 2 incorporates a Gamma distributed random variable to describe unobserved (or omitted) heterogeneity between individuals. The discrete-time hazard function is:

$$h_j\left(X_{ij}\right) = 1 - \exp\left\{ -\exp\left[X_{ij}'\beta + \gamma_j + \theta(t)\right]\right\} \quad \text{..... (3)}$$

where ε is a Gamma distributed random variable with unit mean and variance $\sigma^2 \equiv v.^i$

The same covariates used before are included. To capture the effect of the new labor law, we use a dummy for 2003–05. The piece-wise constant baseline hazard specification is therefore the preferred specification for the baseline hazard estimated in this study. As before, we estimate exit from three different states: 1. the hazard rate for exit from informal PNAW to formal PNARW; 2. the hazard rate for exit from informal PNA to formal PNARW; 3. the hazard rate for exit from notPNAW to formal PNARW.

Model 2 with unobserved individual heterogeneity (frailty) was never significant, and therefore the results from model 1 only are reported below in TablesA6–A8. The figures reported are the estimated coefficients.[11] First, examining the effect of the new labor law on exits to formal PNARW employment, the evidence suggests a positive significant impact for exits from PNAW, PNA, and notPNAW. Although for exits from notPNAW, the effect is weaker once a full set of controls are used. As Table 4 shows, the hazard rate increased from around 3% to 14% for PNAW98–PNARW06. However, for notPNAW98–PNARW06, the increase was small: from only 1.7% to 3%, albeit the evidence suggests that the new labor law has had a positive and significant impact on the hazard rate of exiting into formal PNARW jobs.

In addition, the public sector plays an important role in exits to formal PNARW jobs, suggesting that to a large degree public sector employment dominates private sector ones. In fact, the findings strongly indicate that

11 Note that the proportionate impact of each variable on the state-specific hazard rate can be calculated by taking the exponent of the coefficient.

those institutional factors related to the labor law and the public sector tend to be more important than individual characteristics of workers.

Finally for new entrants, we estimate the hazard rate for a new entrant to the labor market exiting to protected PNARW job. To capture the effect of the new labor law, we use a dummy for 2003–05 and thus adopt a piece-wise constant baseline hazard specification. A number of individual, family, and regional controls are used as before.

As Table A9 shows, the new labor law has had no significant impact on formal PNARW first jobs. The hazard rate was 6.2% before the law and 5.8% after, but that difference was insignificant. However, as was evident before, the public sector plays a significant role in affecting the hazard rate of exits to formal PNARW first jobs.

Table 4: Hazard Rates of Exits to Formal PNARW Jobs (%)

	PNAW98–PNARW06	PNA98–PNARW06	notPNAW98–PNARW06	First Job: PNARW06
2003–2005	14.04	13.97	3.27	5.77*
1998–2002	3.19	3.64	1.68	6.16*

Notes: For a reference person. *Not statistically significant.

6. Conclusion

The introduction of the new labor law in 2003 provides us with an excellent opportunity to study the impact of more flexible employment protection regulations on employment. In particular, this paper examines the effect of the new labor law on formal jobs (i.e. those with contracts) in the private non-agricultural regular waged sector. The findings suggest that the new law has had a positive impact on those who were employed in 1998 in the private non-agricultural sector and in the private non-agricultural waged sector. However, the law has had no significant impact for the new entrants to the labor market. A possible explanation is that employers do not formalize the employment status of new entrants to the labor market. Another important finding is that the growth of public sector employment is an important determinant of mobility into formal private non-agricultural regular waged work. Workers in governorates with high

public sector employment growth are less likely to move into formal private non-agriculture waged employment.

The findings are encouraging: labor flexibility increases formal employment. This should encourage further reforms pertaining to the labor market to increase flexibility in the labor market such as reducing the social security contribution by employers and workers to attempt to reduce informalization and achieve decent employment. However, policymakers must recognize that labor regulation is only one part of the broader economic policy framework. Its interaction with the regulation of product markets, macroeconomic policy, and the business investment climate will determine the overall labor market performance.

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Appendix

Table A1: Moves Before and After 2003

PNAW98 to PNARW06 (%)

Year (%)	No	Yes	Total
1998–2002	94.67	5.33	100
	93.46	*66.29*	*91.47*
2003–2005	70.96	29.04	100
	6.54	*33.71*	*8.53*
Total	92.65	7.35	100
	100	*100*	*100*

PNA98 to PNARW06 (%)

Year (%)	No	Yes	Total
1998–2002	94.14	5.87	100
	92.31	*64.78*	*90.07*
2003–2005	71.13	28.87	100
	7.69	*35.22*	*9.93*
Total	91.86	8.14	100
	100	*100*	*100*

notPNAW98 to PNARW06 (%)

Year (%)	No	Yes	Total
1998–2002	97.32	2.68	100
	90.6	*67.38*	*89.77*
2003–2005	88.62	11.38	100
	9.4	*32.62*	*10.23*
Total	96.43	3.57	100
	100	100	100

Notes: In each entry, the first figure is the % of the *row*; the second figure in italics is the % in the given *column*.
PNAW98: private non-agriculture waged employment in 1998; PNA98: private non-agriculture employment in 1998; notPNAW98: not private non-agriculture waged in 1998; PNARW06: private non-agriculture regular waged in 2006.

Table A2: Probability of Holding a Job Contract in 2006: Marginal Effects
PNAW in 1998 and PNARW in 2006

	All (1)	All (2)	All (3)	Males (4)	Males (5)	Males (6)
2003–2005 dummy	0.237	0.242	0.236	0.268	0.281	0.267
	(5.53)**	(5.60)**	(5.56)**	(5.65)**	(5.77)**	(5.67)**
Public Jobs	-0.008	-0.007	-0.007	-0.008	-0.008	-0.008
	(2.47)*	(2.38)*	(2.31)*	(2.32)*	(2.29)*	(2.18)*
Individual Characteristics						
Male	0.040	0.045	0.039			
	(1.53)	(2.38)*	(1.60)			
Age (ref: 20–29 years)						
30–39 years	-0.001	-0.010	-0.004	0.002	-0.018	-0.002
	(0.06)	(0.46)	(0.19)	(0.08)	(0.95)	(0.07)
40–49 years	-0.022	-0.026	-0.022	-0.016	-0.036	-0.018
	(0.52)	(0.68)	(0.57)	(0.33)	(1.20)	(0.39)
Educational Levels (ref. None)						
Reads & writes	-0.006	-0.005	-0.010	-0.006	-0.005	-0.011
	(0.20)	(0.19)	(0.37)	(0.19)	(0.16)	(0.36)
Less than interm.	-0.013	-0.011	-0.020	-0.014	-0.007	-0.021
	(0.52)	(0.45)	(0.86)	(0.53)	(0.26)	(0.85)
Intermediate	0.007	0.007	-0.002	0.002	0.017	-0.006
	(0.26)	(0.28)	(0.07)	(0.07)	(0.61)	(0.23)
Higher than interm.	-0.010	-0.011	-0.018	-0.013	0.002	-0.020
	(0.25)	(0.27)	(0.48)	(0.30)	(0.05)	(0.50)
University	0.017	-0.024	0.001	0.026	0.003	0.009
	(0.45)	(0.73)	(0.03)	(0.60)	(0.09)	(0.25)
Job characteristics in 1998						
Tenure before '98	-0.002	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.87)	(0.59)	(0.70)	(0.97)	(0.63)	(0.79)
Professional in '98		0.220			0.161	
		(2.30)*			(1.97)*	
Job Region in 1998 (ref: Greater Cairo)						
Alex & Canal Cities	0.035	0.044	0.035	0.046	0.052	0.045
	(1.31)	(1.58)	(1.38)	(1.51)	(1.65)	(1.54)

continued ►

Lower Urban	0.012	0.020	0.013	0.017	0.023	0.018
	(0.36)	(0.58)	(0.40)	(0.47)	(0.59)	(0.49)
Upper Urban	0.027	0.034	0.033	0.031	0.036	0.037
	(0.93)	(1.14)	(1.14)	(0.96)	(1.06)	(1.14)
Lower Rural	0.001	0.008	0.007	0.001	0.005	0.007
	(0.03)	(0.21)	(0.18)	(0.03)	(0.12)	(0.16)
Upper Rural	0.048	0.056	0.060	0.054	0.058	0.066
	(0.90)	(1.02)	(1.09)	(0.93)	(0.97)	(1.12)
Father's characteristics						
White collar	0.052	0.045	0.033	0.043	0.041	0.025
	(2.44)*	(2.22)*	(1.67)	(1.97)*	(1.83)	(1.20)
Illiterate			-0.041			-0.044
			(2.23)*			(2.14)*
No of Obs.	570	570	570	533	533	533

Notes: Robust t-statistics in parentheses. * significant at 5%; ** significant at 1%

Table A3: Probability of Holding a Job Contract in 2006: Marginal Effects
PNA in 1998 and PNARW in 2006

	All	All	All	Males	Males	Males
	(1)	(2)	(3)	(4)	(5)	(6)
2003–2005 dummy	0.212	0.215	0.208	0.239	0.249	0.235
	(5.39)**	(5.47)**	(5.39)**	(5.54)**	(5.65)**	(5.55)**
Public Jobs	-0.008	-0.008	-0.008	-0.008	-0.009	-0.008
	(2.61)**	(2.53)*	(2.53)*	(2.48)*	(2.47)*	(2.41)*
Individual Characteristics						
Male	0.047	0.051	0.045			
	(1.69)	(2.53)*	(1.76)			
Age (ref: 20–29 years)						
30–39 years	0.005	-0.005	0.002	0.010	-0.016	0.006
	(0.20)	(0.20)	(0.07)	(0.36)	(0.83)	(0.21)
40–49 years	0.000	-0.007	-0.005	0.012	-0.026	0.004
	(0.00)	(0.16)	(0.12)	(0.21)	(0.82)	(0.07)

continued ►

Educational Levels (ref. None)

Reads & writes	0.010	0.010	0.004	0.011	0.011	0.004
	(0.32)	(0.31)	(0.12)	(0.30)	(0.31)	(0.12)
Less than interm.	-0.009	-0.007	-0.017	-0.010	-0.001	-0.019
	(0.30)	(0.25)	(0.66)	(0.33)	(0.04)	(0.68)
Intermediate	0.022	0.022	0.010	0.018	0.039	0.006
	(0.73)	(0.74)	(0.36)	(0.54)	(1.21)	(0.20)
Higher than interm.	0.025	0.025	0.008	0.024	0.061	0.008
	(0.48)	(0.48)	(0.18)	(0.43)	(0.98)	(0.16)
University	0.032	-0.018	0.011	0.042	0.022	0.021
	(0.73)	(0.48)	(0.30)	(0.85)	(0.46)	(0.48)

Job characteristics in 1998

Tenure before '98	-0.002	-0.001	-0.002	-0.003		-0.002
	(1.07)	(0.80)	(0.91)	(1.19)		(1.02)
Professional in '98	0.213			0.159		
	(2.22)*			(1.91)		

Job Regions in 1998 (ref: Greater Cairo)

Alex. & Canal Cities	0.028	0.036	0.028	0.037	0.042	0.035
	(1.01)	(1.26)	(1.04)	(1.17)	(1.29)	(1.18)
Lower Urban	0.008	0.015	0.009	0.013	0.017	0.014
	(0.24)	(0.43)	(0.28)	(0.35)	(0.45)	(0.38)
Upper Urban	0.013	0.019	0.020	0.016	0.020	0.023
	(0.45)	(0.64)	(0.68)	(0.51)	(0.59)	(0.71)
Lower Rural	0.044	0.051	0.050	0.050	0.055	0.057
	(1.18)	(1.36)	(1.31)	(1.22)	(1.30)	(1.34)
Upper Rural	0.030	0.034	0.039	0.034	0.032	0.044
	(0.56)	(0.64)	(0.72)	(0.59)	(0.56)	(0.75)

Father's characteristics

White collar	0.059	0.053	0.040	0.051	0.050	0.032
	(2.66)**	(2.47)*	(1.90)	(2.23)*	(2.12)*	(1.47)
Illiterate			-0.042			-0.045
			(2.27)*			(2.21)*
No of Obs.	603	603	603	565	565	565

Notes: Robust t-statistics in parentheses. * significant at 5%; ** significant at 1%

Table A4: Probability of Holding a Job Contract in 2006: Marginal Effects notPNAW in 1998 and PNARW in 2006

	All	All	All	All
	(1)	(2)	(3)	(4)
2003–2005 dummy	0.009	0.008	0.004	0.004
	(2.50)*	(2.43)*	(1.40)	(1.45)
Public Jobs	-0.001	-0.001	-0.001	-0.001
	(5.00)**	(4.89)**	(4.41)**	(3.23)**
Individual Characteristics				
Male	0.004	0.004	0.004	0.004
	(1.96))*	(1.99)*	(1.88)	(1.94)*
Age (ref: 20–29 years)				
30–39 years	-0.018	-0.017	-0.011	-0.011
	(6.06)**	(6.08)**	(4.07)**	(4.04)**
40–49 years	-0.012	-0.012	-0.005	-0.004
	(5.21)**	(5.23)**	(1.84)	(1.33)
Educational Levels (ref.: None)				
Reads & writes	0.005	0.005	0.005	
	(0.45)	(0.43)	(0.50)	
Less than interm.	0.013	0.011	0.010	
	(1.36)	(1.20)	(1.20)	
Intermediate	0.012	0.009	0.008	
	(1.62)	(1.31)	(1.31)	
Higher than interm.	0.023	0.018	0.018	0.003
	(1.91)	(1.63)	(1.84)	(0.71)
University	0.029	0.023	0.029	0.004
	(3.03)**	(2.57)*	(3.35)**	(1.97)*
Job characteristics in 1998				
Tenure before '98			-0.0004	-0.0004
			(2.66)**	(3.01)**
Professional in '98			-0.010	
			(5.21)**	
Self employed in '98				-0.005
				(1.55)
Unpaid worker in '98				0.005

continued ►

				(1.05)
Housewife in '98				-0.006
				(1.63)
Urban	-0.006	-0.006	-0.004	-0.004
	(2.23)*	(2.14)*	(1.72)	(1.70)
Father's characteristics				
White collar	0.004	0.002	0.003	0.005
	(1.81)	(1.18)	(1.72)	(2.29) *
Illiterate		-0.004		
		(1.73)		
No. of Obs.	3880	3880	3880	3880

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

Table A5: Probability of Holding a Job Contract in 2006: Marginal Effects notPNAW in 1998 and PNARW in 2006: Males

	Males	Males	Males	Males
	(1)	(2)	(3)	(4)
2003–2005 dummy	0.012	0.009	0.010	0.010
	(2.20)*	(1.77)	(2.11)*	(1.54)
Public Jobs	-0.002	-0.001	-0.001	-0.001
	(4.05)**	(3.71)**	(3.96)**	(3.44)**
Individual Characteristics				
Age				
30–39 years	-0.014	-0.013	-0.014	-0.012
	(3.36)**	(3.11)**	(3.39)**	(3.13)**
40–49 years	-0.001	-0.003	-0.002	-0.003
	(0.24)	(0.53)	(0.36)	(0.66)
Educational Levels (ref.: None)				
Reads & writes			0.013	
			(0.67)	
Less than interm.	0.007	0.008	0.011	
	(0.67)	(0.80)	(0.81)	
Intermediate	0.005	0.008	0.007	

continued ►

	(0.57)	(0.98)	(0.64)	
Higher than interm.	0.008	0.017	0.011	0.004
	(0.74)	(1.34)	(0.79)	(0.78)
University	0.015	0.032	0.016	0.013
	(1.53)	(2.79)**	(1.31)	(3.49)**
Job characteristics in 1998				
Tenure before '98	-0.001	-0.001	-0.001	-0.001
	(2.95)**	(2.55)*	(2.87)**	(2.46)**
Professional in '98		-0.013		-0.011
		(4.36)**		(4.18)**
Self employed in '98				-0.007
				(1.73)
Unpaid worker in '98				0.0001
				(0.04)
Urban	-0.006	-0.005	-0.005	-0.004
	(1.59)	(1.31)	(1.44)	(1.30)
Father's characteristics				
White collar	0.007	0.006	0.004	0.004
	(1.98)*	(1.89)	(1.34)	(1.43)
Illiterate			-0.007	-0.007
			(1.99)*	(2.09)*
No. of Obs.	2709	2709	2709	2709

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

Table A6: Probability of First Job with Contract in 2006: Marginal Effects (PNARW in 2006)

	All	All	Males	Males
	(1)	(2)	(3)	(4)
2003–2005 dummy	-0.011	-0.011	-0.017	-0.017
	(0.96)	(0.98)	(1.16)	(1.17)
Public Jobs	-0.008	-0.008	-0.007	-0.007
	(3.95)**	(3.92)**	(3.03)**	(3.02)**
Individual Characteristics				
Male	0.004	0.006		
	(0.31)	(0.48)		
Age	0.003	0.003	0.013	0.012
	(2.25)*	(2.08)*	(4.70)**	(4.66)**
Educational Levels (ref. None)				
Reads & writes	0.158	0.140		
	(1.09)	(1.03)		
Less than interm.	0.272	0.245	0.079	0.074
	(2.32)*	(2.17)*	(0.75)	(0.71)
Intermediate	0.118	0.105	0.023	0.022
	(1.89)	(1.71)	(0.33)	(0.30)
Higher than interm.	0.348	0.294	0.098	0.093
	(2.73)**	(2.43)*	(0.94)	(0.90)
University	0.357	0.307	0.113	0.108
	(3.60)**	(3.21)**	(1.28)	(1.22)
Job Region (ref: Greater Cairo)				
Alex. & Canal Cities	0.008	0.009	0.016	0.016
	(0.51)	(0.55)	(0.74)	(0.72)
Lower Urban	-0.004	-0.004	0.000	0.000
	(0.22)	(0.18)	(0.01)	(0.00)
Upper Urban	0.021	0.021	0.045	0.045
	(1.19)	(1.20)	(2.02)*	(2.02)*
Lower Rural	-0.076	-0.073	-0.091	-0.091
	(3.73)**	(3.63)**	(2.82)**	(2.81)**
Upper Rural	-0.076	-0.073	-0.068	-0.068
	(3.82)**	(3.67)**	(2.97)**	(2.92)**

continued ▶

Father's characteristics

White collar		0.018	0.012	0.009
		(1.43)	(0.78)	(0.58)
Illiterate		-0.023		-0.010
		(1.70)		(0.56)
No. of Obs.	1666	1666	1145	1145

Notes. Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

Table A7: Hazard Rate of Holding a Job Contract in 2006: Males

	PNAW98 - PNAW06				PNA98 - PNAW06			
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
2003–2005 dummy	1.839	5.49	1.859	5.5	1.715	5.4	1.715	5.36
Public Jobs	-0.169	-2.14	-0.174	-2.16	-0.146	-2.19	-0.148	-2.16
Individual Characteristics								
Age (ref: 20–29 years)								
30–39 years	0.111	0.2	-0.043	-0.08	0.211	0.41	0.099	0.19
40–49 years	-15.813	-0.01	-15.984	-0.01	-0.658	-0.52	-0.914	-0.72
Educational Level (ref: none)								
Reads and writes	0.191	0.23	-0.025	-0.03	0.621	0.81	0.429	0.55
Less than interm.	-0.143	-0.2	-0.312	-0.42	0.129	0.18	-0.086	-0.12
Intermediate	0.165	0.23	0.009	0.01	0.559	0.8	0.364	0.51
Higher than interm.	-0.182	-0.17	-0.372	-0.35	0.562	0.6	0.317	0.33
University	0.407	0.47	0.222	0.25	0.733	0.87	0.522	0.61
Job Region in 1998 (ref: Greater Cairo)								
Alex & Canal Cities	0.788	1.78	0.902	2.02	0.663	1.55	0.745	1.73
Lower Urban	0.411	0.62	0.557	0.81	0.199	0.32	0.297	0.47
Upper Urban	0.607	1.18	0.772	1.46	0.297	0.61	0.451	0.91
Lower Rural	0.321	0.39	0.519	0.63	0.805	1.35	0.921	1.53
Upper Rural	-0.323	-0.3	0.030	0.03	-0.495	-0.46	-0.249	-0.23

continued ►

Job characteristics in 1998

Tenure before '98	-0.042	-1.00	-0.030	-0.72	-0.046	-1.13	-0.037	-0.91

Father's characteristics

White collar	0.693	1.83	0.461	1.16	0.700	2.04	0.460	1.28
Illiterate			-0.816	-2.20			-0.755	-2.17
Constant	-8.109	-4.54	-7.827	-4.29	-7.912	-5.14	-7.492	-4.78

person-years	4091	4091	4326	4326
Log Likelihood	-194.69	-192.17	-220.30	-217.87

Table A8: Hazard Rate of Holding a Job Contract in 2006
notPNAW in 1998 and PNARW in 2006

	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
2003–2005 dummy	0.410	1.68	0.191	0.78	0.459	1.71	0.270	1.00
Public Jobs	-0.129	-4.35	-0.122	-3.98	-0.127	-3.83	-0.122	-3.58

Individual Characteristics

Male	0.587	2.18	0.401	1.46				
Age								
30–39 years	-1.859	-3.32	-1.771	-3.07	-1.530	-2.33	-1.499	-2.24
40–49 years	-0.423	-0.64	-0.658	-0.93	0.408	0.5	0.006	0.01

Educational Levels

Read & write	1.058	0.75	0.770	0.54				
Less than interm.	1.252	1.13	0.985	0.88				
Intermediate	1.258	1.21	1.070	1.01				
Higher than interm.	1.520	1.41	1.481	1.34	0.321	0.72	0.458	1.02
University	1.790	1.74	1.861	1.73	0.547	1.86	0.816	2.6
Urban	-0.791	-2.47	-0.685	-2.11	-0.711	-2.11	-0.618	-1.82

continued ▶

Job characteristics in 1998

Tenure before '98	-0.104	-3.61	-0.078	-2.64	-0.128	-3.59	-0.096	-2.8
Professional '98			-2.225	-4.26			-1.861	-3.54
Self employed '98			-0.896	-1.49			-0.787	-1.3
Unpaid '98			-0.049	-0.11			-0.077	-0.16
Housewife '98			-1.180	-1.12				

Father's characteristics

White collar	0.403	1.84	0.293	1.28	0.469	1.94	0.329	1.31
Illiterate			-0.396	-1.33			-0.527	-1.57
Constant	-7.953	-6.45	-7.318	-5.68	-6.215	-7.53	-5.982	-7.11

person-year	30547	30547	21272	21272
Log likelihood	-524.12	-504.583	-418.674	-406.262

Table A9: Hazard Rate of First Job with Contract in 2006 (PNARW in 2006)

	All				Males			
	(1)		(2)		(3)		(4)	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
2003–2005 dummy	-0.150	-1.04	-0.142	-0.99	-0.164	-0.96	-0.161	-0.94
Public Jobs	-0.081	-2.65	-0.080	-2.64	-0.069	-2.05	-0.069	-2.05

Individual Characteristics

Male	-0.008	-0.05	-0.011	-0.07				
Age	-0.139	-5.96	-0.137	-5.9	-0.078	-2.45	-0.078	-2.44
Education								
Less than interm	1.538	1.97	1.646	2.12				
Intermediate	1.018	1.37	1.127	1.52				
Higher than interm	1.539	2.00	1.665	2.17	0.450	1.37	0.458	1.40
University	1.735	2.36	1.881	2.58	0.556	2.66	0.570	2.75

continued ▶

Job Region in 98 (ref. Greater Cairo)

Alex., Canal Cities	0.025	0.13	0.034	0.18	0.083	0.37	0.087	0.39
Lower Urban	-0.153	-0.57	-0.155	-0.57	-0.161	-0.51	-0.159	-0.5
Upper Urban	0.160	0.8	0.153	0.77	0.322	1.44	0.322	1.44
Lower Rural	-1.970	-3.25	-2.014	-3.32	-2.775	-2.71	-2.788	-2.73
Upper Rural	-1.809	-2.98	-1.859	-3.07	-1.371	-2.24	-1.384	-2.26

Father's characteristics

White collar	0.171	1.12	0.235	1.6	0.110	0.62	0.132	0.77
Illiterate	-0.291	-1.48			-0.094	-0.43		
Constant	-2.694	-2.35	-2.945	-2.61	-2.820	-2.84	-2.876	-2.93
person-year		7102		7102		3811		3811
Log likelihood		-821.448		-822.594		-597.764		-597.859

Jackline Wahba is an Associate Professor in Economics at the University of Southampton, Southampton, United Kingdom. Email address: J.Wahba@soton.ac.uk

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Population Council
West Asia and North Africa
59 Misr Helwan Agricultural Road, Maadi, Cairo, Egypt
Tel.: (+202) 2525-5965, (+202) 2525-5967, (+202) 2525-5968
Facsimile: (+202) 2525-5962
Email: pcouncil@popcouncil.org http://www.popcouncil.org

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Abstract

This paper examines the effect of the new labor law of 2003, which provides flexibility in the hiring and firing procedures since labor market inflexibility was seen as one of the obstacles to job creation in Egypt. The analysis focuses on the effect of the new law on formal employment (jobs with contracts) in the private non-agricultural regular waged sector. The findings suggest that the new law has had a positive impact on those who were employed in 1998 in the private non-agricultural sector and in the private non-agricultural waged sector. However, the effect was not significant for new entrants to the labor market looking for first jobs.

1. Introduction

Egypt has undergone a number of economic reform measures since the early 1990s, with the aim of liberalizing the economy and moving toward a market economy. As a result, among other measures, the Egyptian government has introduced a new labor law (No. 12) with the goal of increasing flexibility in the labor market. Law 12, which came in effect in July 2003, provides comprehensive guidelines for the recruitment, hiring, compensation, and termination of employees. In particular, it provides increased flexibility for firms in the hiring/firing process, which has been a major bottleneck for job creation in the Egyptian labor market.

The introduction of the new labor law in Egypt provides us with an opportunity to study the impact of regulations that aim to provide more flexibility in the labor market. Indeed, there is a wide disagreement among economists on the benefits of labor market regulations and on the impact of labor market flexibility on employment in particular. Some economists believe that unregulated labor markets are superior to regulated ones. On the other hand, others argue that regulations are needed to protect poor and vulnerable workers.[1] Given the change in the law, this paper examines the effect of introducing more flexible employment protection legislation in Egypt.

This paper will explore the following issues: What is the effect of the new labor law on informalization? Does the introduction of more flexible

1 See Freeman (1993) for a summary of this debate.

labor codes that facilitate the hiring/firing process lead to an increase in formal employment? This is an important issue for developing countries, like Egypt, where the informal sector has been growing recently and has become the main employer in the economy. Yet informal employment tends to be of low quality with no job security and no social security coverage. From a policy perspective, it is essential to investigate whether a more flexible labor market would encourage the growth of the private formal sector leading to more protected jobs.

The structure of the paper will be as follows. Section 2 will review the previous literature dealing with labor market regulations and focus on the effect of employment protection regulations. Section 3 will discuss Egypt's Labor Law no. 12 and its aims. Section 4 will examine what has happened to informalization in Egypt in general and then whether the new labor law has had any impact on informal employment. Section 5 will go beyond descriptive analysis to test for the impact of the new labor law for different groups of workers. Section 6 concludes.

2. Literature Review

The functioning of labor markets depends on institutions and regulations. For example, labor market regulations can affect the rate of job creation and destruction, the levels of employment and unemployment in the economy, and the degree of social protection provided to workers. However, there is wide disagreement among economists on the benefits of labor market regulations. Some economists believe that unregulated labor markets are superior to regulated ones; i.e. more efficient. They argue that labor market regulations introduce distortions that misallocate labor; waste resources through rent seeking, impede adjustments to economic shocks, discourage hiring, and favor "insiders" (such as regular workers, or males) and therefore reduce growth. Freeman (1993) refers to that view as the "distortionist." On the other hand, some believe that due to market failure and the ensuing injustice and inequity, regulations are needed to protect poor and vulnerable workers. This is referred to as the "institutionalist" view.[2]

There are various forms of labor regulations. In general, labor market regulations are introduced with the objective of protecting workers from

2 See Freeman (1993) for a summary of this debate.

uninsurable labor market risk, such as *employment* risk, or from *earnings* risk. To improve the earnings of the most disadvantaged categories of workers, governments typically set minimum wages; they might also mandate that employers provide non-wage benefits to their workers, such as healthcare, paid vacations, maternity leave, etc. To protect workers from employment risk, governments can decide to protect existing jobs by restricting the ability of firms to lay off employees at will and/or provide unemployment insurance to those who lose their job. (Boeri et al. 2008)

In this paper, the focus is on one particular set of labor market regulations namely employment protection, or job security, rules that refer to hiring and firing arrangements. These can cover what kinds of contracts are allowed, the conditions under which workers can be terminated, requirements for severance and advance notice of termination, redundancy procedures, and special rules for mass layoffs.

The degree to which employment protection rules are rigid or flexible can affect labor market outcomes including employment levels, labor dynamics (i.e. employment fluctuations), and the composition of employment. Rigid employment rules are expected to lengthen job tenure and reduce labor turnover, protecting the jobs of incumbent employees and limiting hiring opportunities. At the same time, rigid job security rules affect the composition of employment by shifting labor to uncovered (informal) sectors or employment types. Obviously, the effectiveness of labor regulation will depend on the extent to which those regulations are enforced.

Betcherman et al (2001) summarize the theoretical impact of strict termination rules as follows: lower labor turnover rates (hirings plus separations); lower aggregate employment levels; greater numbers of long-tenure jobs; lower labor force participation rates; no clear impact on unemployment levels, but longer average unemployment durations; at a macro level, slower recovery from an aggregate shock; more self-employment as a share of total employment; more non-standard employment (e.g., part-time or temporary); positive employment effects for skilled prime-age males but lower employment for women, young people, and less-skilled workers. They add that the empirical findings are strongest for the dynamic effects—on turnover and tenure and flows between employment and unemployment and in terms of who benefits from employment protection rules and who does not. For example, in Latin America there is evidence of negative employment effects of job security rules.

In the last two decades or so, there has been a move toward labor market flexibility and many countries introduced labor market reforms to

enhance productivity, competition, and to accelerate employment generation and improve economic performance. Yet the empirical evidence on the effects of labor flexibility is mixed.

The main empirical evidence on the effect of labor market flexibility has focused mainly on developed countries but have more recently included studies on less-developed countries (LDCs). The focus of the studies on DCs has been on whether excessively strict employment protection law has been an important contributor to the persistently high unemployment experienced in many countries that are part of the Organisation for Economic Co-operation and Development (OECD). However, the empirical research has not provided a clear-cut answer. Early on, Lazear (1990), using data on severance pay and periods of notice required before employment termination for 22 developed countries for the period 1956–84, found some evidence that they have a negative relationship with the employment rate and a positive one with the unemployment rate.

Di Tella and MacCulloch (2005), using a new data set on hiring and firing restrictions for 21 OECD countries for the period 1984–90 based on surveys of business people in the countries covered, controlling for country and time fixed effects, and adopting dynamic panel data techniques, found evidence that increasing the flexibility of the labor market increases both the employment rate and the rate of participation in the labor force. There is also some evidence that more flexibility leads to lower unemployment rates and to lower rates of long-term unemployment. They also found evidence consistent with the hypothesis that inflexible labor markets produce "jobless recoveries" and introduce more unemployment persistence.

As argued by Boeri et al. (2008), developing countries are often fundamentally different from developed economies. Poorer countries tend to have stricter labor regulations compared to richer countries, even though they offer less social protection. At the same time, rigid labor regulation is associated with a larger informal sector that is associated with worse working conditions and poor job "quality" (Boeri et al. [2008]). Developing countries are often characterized by weak law enforcement, a large informal sector, underdeveloped capital markets, and informal credit and insurance networks. Ignoring these features when studying developing economies can be problematic.

According to the World Bank in *Doing Business 2009*, developing countries tend to mistakenly go to the extreme of rigid regulations, pushing employers and workers into the informal sector. Overly rigid regulations may have undesirable effects such as less job creation, smaller company

size, less investment in research and development, and longer spells of unemployment and thus the obsolescence of skills, all of which may reduce productivity growth. Hence excessive rigidity can be to the detriment of businesses and workers alike.

Recent studies have examined the effect of labor market regulations and labor market flexibility in developing countries. For example, Kingdon et al. (2006) argue that the failure of African labor markets to create good paying jobs was the result of lack of labor market "flexibility" keeping formal sector wages above their equilibrium level and restricting job creation. This has resulted in excess labor supply in the form of either open unemployment or a growing self-employment sector.

Besley and Burgess (2004) examine the link between regulation and long-term development in India by looking at state amendments to the Industrial Disputes Act of 1947. Their empirical evidence suggests that labor regulation is a key factor in the pattern of manufacturing development in India. Regulating in a pro-worker direction was associated with lower levels of investment, employment, productivity and output in registered manufacturing. It also increased informal sector activity.

Kugler (2004) examines impact of the Colombian labor market reform of 1990 which substantially reduced the costs of dismissing workers through the reduction of severance payments on unemployment. Using micro-level data from Colombia, she finds that those reforms contributed to 10% of the reduction in unemployment during the period of study.

In the next section, the changes in labor regulations in Egypt are described first before examining the impact of those employment protection reforms on informal/formal employment.

3. The New Labor Law

The Egyptian government introduced a new labor law (No.12) in 2003. The new law provides comprehensive guidelines for the recruitment, hiring, compensation, and termination of employees. The law comprises 257 articles that address all the legal aspects regulating the Egyptian labor market. The law aims to increase private sector involvement and at the same time achieve a balance between employees' and employers' rights.

Among the most important issues that the new law addresses is the right of an employer to fire an employee and the conditions pertaining to this, as well as granting employees the right to carry out a peaceful strike according

to controls and procedures prescribed in the new law. In particular, the new law provides increased flexibility for firms in the hiring/firing process, which has been a major bottleneck for job creation in the Egyptian labor market.

The new labor law allows private sector employers to renew a temporary contract without transforming it automatically into a permanent employment status as was stated in the preceding law. Also, under the new regulation, employers can terminate a contract more easily and lay offs can be justified by difficult economic conditions. In return, workers that have been dismissed have the right to appeal. However, this law does not apply to public servants of state agencies, including local government units and public authorities, nor to self-employed workers.

Until July 2003, when the new labor law was enforced, existing legislation had been rather stringent both for workers and for employers. It prohibited employers from terminating the contract of a worker after a probation period. In addition, employers were not allowed to recruit workers directly but through local employment offices.

Thus, given the new labor regulations, it seems important to examine the effect of the new labor on employment, in particular on informal employment. Theoretically, one would expect the new law to enable employers to hire and fire workers more easily and hence to enable them to hire more workers formally. In the following section we test the hypothesis that the introduction of the new labor law has led to more formal private employment.

4. What Has Happened to Informalization?

4.1 Data

The analysis in this paper will be based on Egypt Labor Market Panel Survey of 2006 (ELMPS06) which is a follow-up survey to Egypt Labor Market Survey of 1998 (ELMS98). Both surveys carried out by the Economic Research Forum (ERF) in cooperation with the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS)—the main statistical agency of the Egyptian government. The ELMPS06 is the second round of what is intended to be a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households and individuals interviewed in 1998, any new households that might have formed as a result of splits from the original households, as well as

a refresher sample of households to ensure that the data continue to be nationally representative.

The fieldwork for ELMPS06 was carried out from January to March 2006. The final sample of 8,349 households is made up of 3,684 households from the original ELMS98 survey, 2,167 new households that emerged from these households as a result of splits, and a refresher sample of 2,498 households. Of the 23,997 individuals interviewed in 1998, 17,357 (72%) were successfully re-interviewed in 2006, forming a panel that is used for our analysis. The attrition that occurred in the original 1998 sample was mostly random in nature since it resulted from the loss of records containing identifying information for the 1998 households at CAPMAS. Of the 1,115 households that could not be re-interviewed, 615 are due to loss of records and the remainder is made up of expected losses due to total relocation of the household, death of all household members, or refusal to participate in the survey.[3] The questionnaire for the ELMPS06 is closely based on that used in the ELMS98 to ensure comparability of the data over time.

The surveys provide a rich source of information on labor market conditions of individuals. The surveys collect information on the characteristics of jobs such as on the presence of legal job contract and social security coverage. The paper will make use of the panel nature of ELMPS06 and of data on the characteristics of first jobs, as well as of the rich retrospective information on previous employment characteristics.

4.2 Informality Patterns and Trends

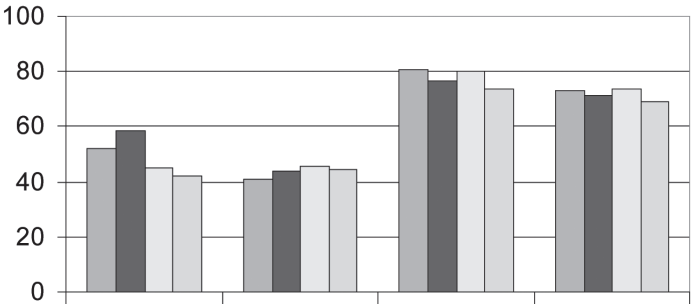
First, examining informality trends between 1998 and 2006 provides an interesting picture (Fig. 1). Looking at informality defined as lack of job contract *and* lack of social security suggests that informality has increased between 1998 and 2006 as a share of total employment and as a share of non-agriculture employment. However, limiting the scope to private non-agriculture waged employment the share of informality has declined over this period.

Measuring informality as lack of job contract *only* also provides a similar pattern. In 2006, 69% of private non-agricultural regular waged workers had no job contracts, down from 74% in 1998, thus suggesting that the decline in informality among private non-agriculture employment is due

3 For more details, see Barsoum (2006).

to more workers holding job contracts and not to do with social security, which is what one would expect if the new labor law has had an impact.

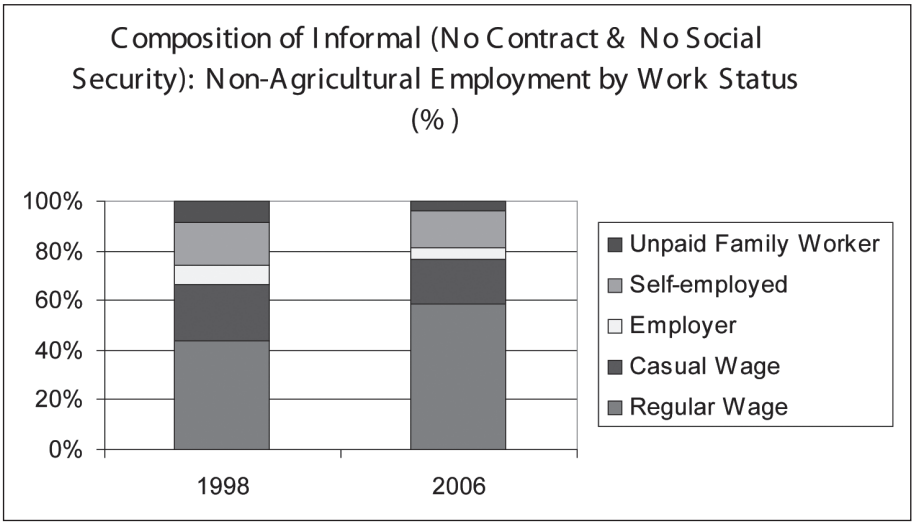
Figure 1: Proportion of Informal Employment



	All workers	Non-Agric	Private, Non-Agric waged	Private, Non-Agric, regular waged
No Contract, No Social Security 1998	52.3	40.89	80.51	73.31
No Contract, No Social Security 2006	58.39	43.93	76.33	71.19
No Contract 1998	44.81	45.56	80.01	73.66
No Contract 2006	42.07	44.5	73.93	69.07

Public sector employees tend to be protected: they hold job contracts and have social security coverage, in addition to other benefits. The agricultural sector is typically excluded from the informal sector since it has its own features: subsistence, family work, etc. Thus, the sector that is of interest to us is the private non-agricultural sector. Examining the composition of the non-agricultural informal employment, the evidence suggests a change between 1998 and 2006. As Figure 2 shows, the proportion of regular waged workers has increased by almost 15 percentage points and amounted to almost 60% in 2006. At the same time, the share of casual waged workers has also declined. Meanwhile the share of unpaid family workers also fell over this time period. This suggests that informal employment is increasingly becoming dominated by regular waged work and not self-employment or employers.

Figure 2: Composition of Informal (No Contract & No Social Security): Non-Agricultural Employment by Work Status



Given that the change in the labor law applies only to the private (non-agricultural) sector and that only waged workers may hold contracts (i.e. self-employed workers and employers do not hold job contracts), the focus of this paper will be on private non-agricultural regular waged work. Regular work includes both permanent and temporary, but excludes seasonal and intermittent. The aim of the paper is to test whether the new labor law affected the proportion of job contract holders among the private non-agricultural regular waged workers (PNARW) in 2006. For the rest of the paper, informality refers to lack of job contract while formality refers to holding a job contract.

An important issue is whether the increase in job contract holders increased as a result of the law. Figure 3 shows the proportion of jobs with contracts that started between 1998 and 2006. There is no evidence that the new labor law has had an effect on the proportion of jobs with contracts in PNARW (Fig. 3). However, limiting the analysis to those who were private non-agricultural regular waged workers in 1998 (PNARW98; Fig. 4a), the fitted trend line shows a positive trend suggesting that there has been an increase in formality (job contract holding) between 1998 and 2006 among PNARW workers. A similar pattern emerges if the analysis is confined to those who were in private non-agricultural employment (waged and non-waged) in 1998—Fig. 4b. This indicates that among those were already employed in private non-agricultural sector there is evidence

that the labor law has had a positive impact on the likelihood of holding job contract in 2006. At the same time this suggests that the new entrants might be the ones who were not affected by the new labor law, an issue we investigate further below.

Figure 3: Proportion of Jobs with Contract by Year of Job Start

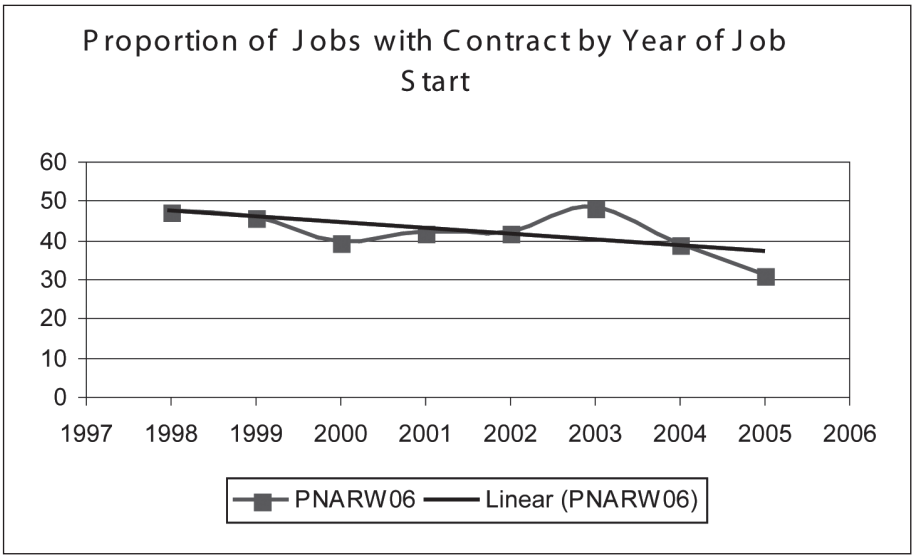


Figure 4a: Proportion of Jobs with Contract by Year of Job Start

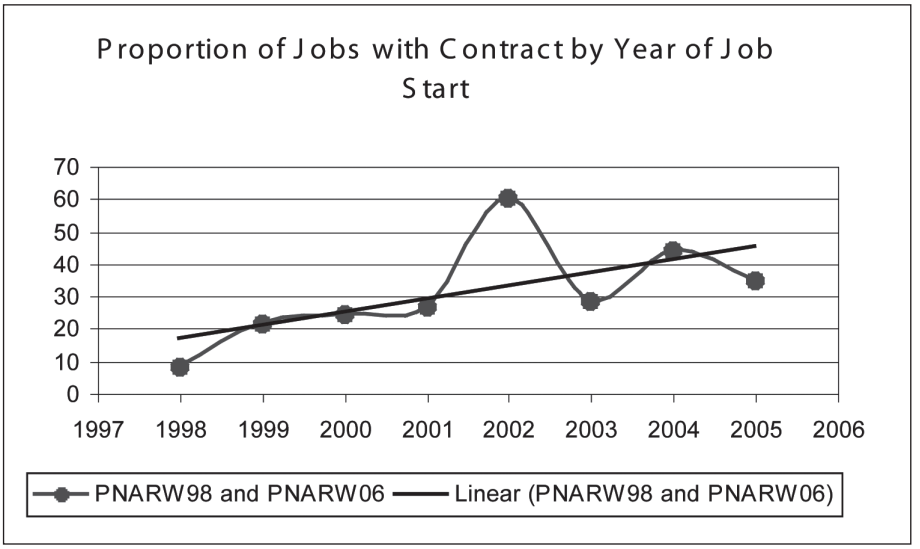
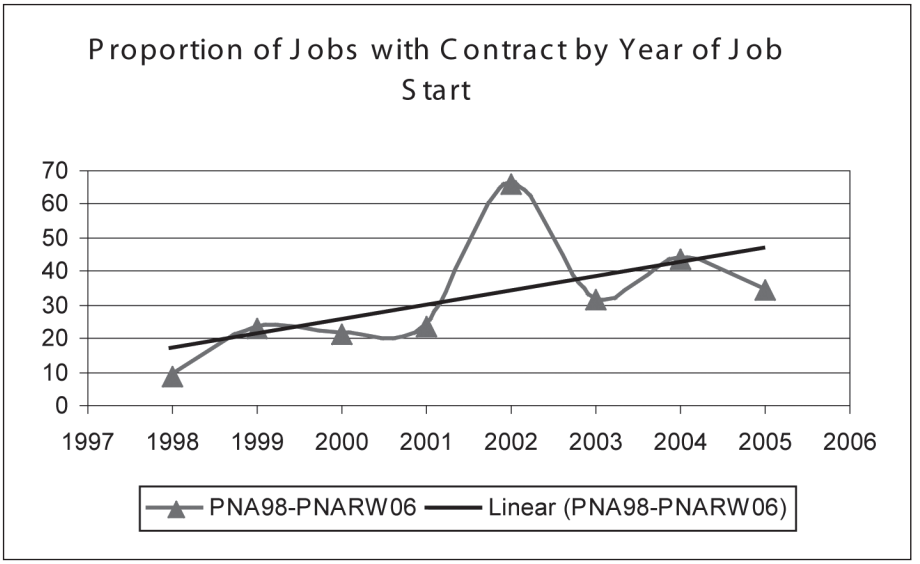
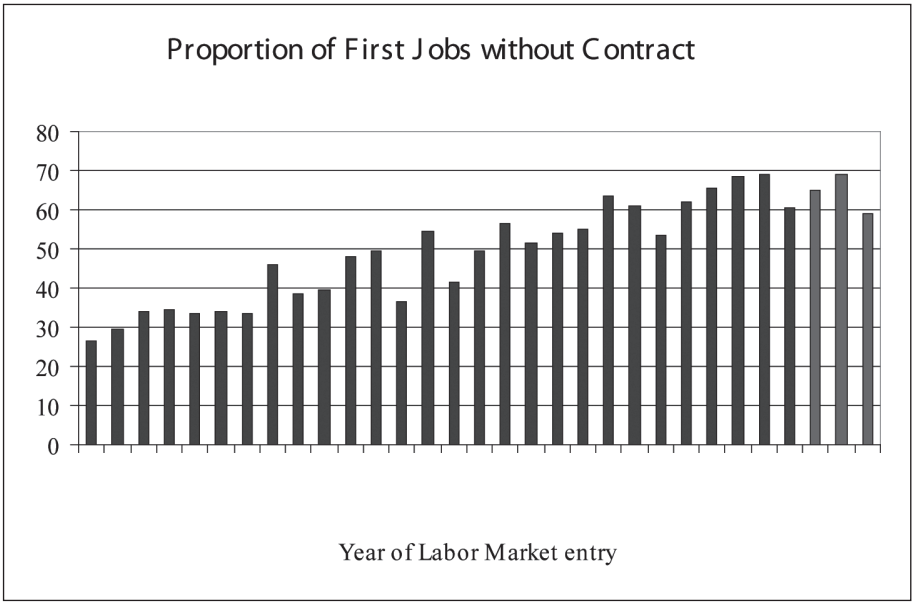


Figure 4b: Proportion of Jobs with Contract by Year of Job Start



Over the last three decades, new entrants to the labor market have become increasingly likely to start their careers in the informal sector. Moktar and Wahba (2000) have found that in the early 1970s, 20% of workers used to start their working life with informal jobs, but by 1998, 69% of new workers have started in informal employment. Figure 5 shows the proportion of first jobs without contracts between 1975 and 2005. There has been an increase in the trend of first jobs of those aged 18–45 years of age being not protected by contracts over the whole period. This might explain why in Fig. 3, when we examine all jobs that started between 1998 and 2006, we don't find a positive trend since new entrants (first jobs) are included.

Figure 5: Proportion of First Jobs without Contract



4.3 Transition to PNARW Jobs with Contracts

Next we examine the rate of transition for different types of workers between 1998 and 2006 and limit the analysis to those who were aged 20–50 years old in 1998. As seen in Table 1, around 8% of workers who were engaged in informal private non-agricultural employment (PNA) have become formal private non-agricultural regular waged (PNARW) workers in 2006. Also, 7% of workers who were informal PNAW in 1998 became formal PNARW by 2006. Finally among those who were notPNAW in 1998, 4% acquired job contracts by 2006. This last group (notPNAW) includes those where not working in 1998, such as students and housewives, non-waged workers, agricultural workers, and public sector workers in 1998, but who were working in 2006.

Table 1: Transition Matrices

	Private Non-Agriculture Regular Waged Work (PNARW) in 2006		
	Job Contract 2006	No Job Contract 2006	Total
Private Non-Agriculture Employment (PNA) in 1998			
Job Contract 1998	93.99	6.01	100 (33.21)
No Job Contract 1998	8.14	91.86	100 (66.79)
Total	36.66	63.34	100 (100)

	Private Non-Agriculture Regular Waged Work (PNARW) in 2006		
	Job Contract 2006	No Job Contract 2006	Total
Private Non-Agriculture Waged Work (PNAW) in 1998			
Job Contract 1998	93.99	6.01	100 (34.43)
No Job Contract 1998	7.35	92.65	100 (65.57)
Total	37.18	62.82	100 (100)

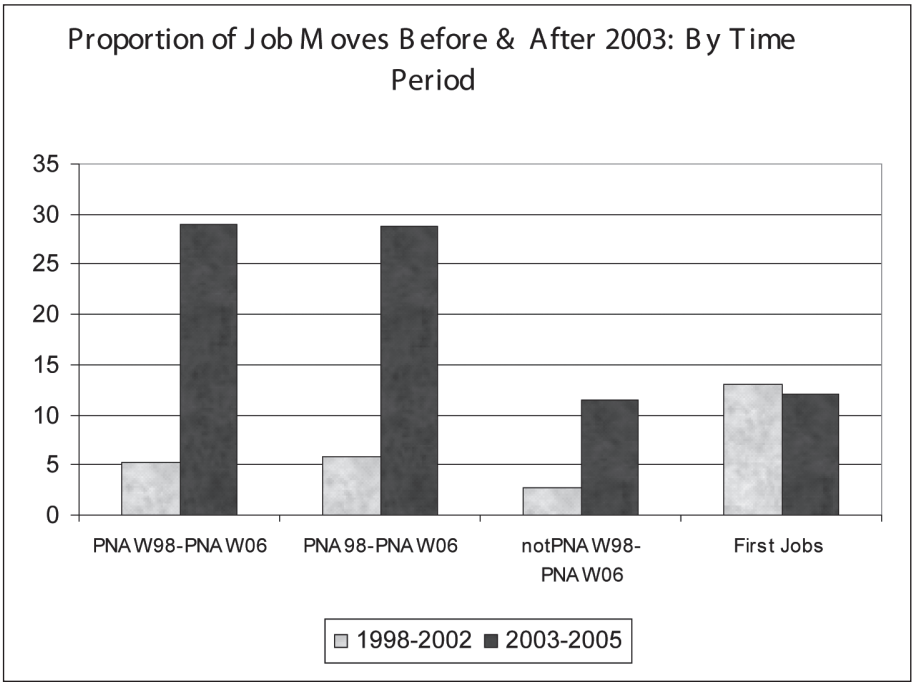
	Private Non-Agriculture Regular Waged Work (PNARW) in 2006		
	Job Contract 2006	No Job Contract 2006	Total
Not Private Non-Agriculture Waged Work (notPNAW) in 1998			
Job Contract 1998	97.88	2.12	100 (53.02)
No Job Contract 1998	4.22	95.78	100 (46.98)
Total	53.88	46.12	100 (100)

Notes: Figures in parentheses are the column sum in percent.

Table A1 provides the transition rate to formal PNARW before and after 2003, the year the law was introduced. Almost 34% of movers between informal PNAW98 and formal PNARW06 moved between 2003–05. However, 5% of the moves between 1998–2002 were moves from PNAW98 to PNARW06 compared to 29% between 2003–05 as illustrated in Fig. 6.

Similar patterns are observed for moves between PNA98–PNARW06 and notPNAW98–PNARW06 suggesting that the proportion of moves to PNARW was higher between 2003–05 than between 1998–2002, supporting the hypothesis that the new labor law has had a positive impact on formal employment among employed workers. However, there doesn't seem to be an impact for first jobs.

Figure 6: Proportion of Job Moves Before & After 2003: By Time Period



A striking, yet unsurprising, aspect of the characteristics of informal workers in 1998 that became formal by 2006, i.e. movers, is that they are predominantly male. The transition rates for females to PNARW in 2006 are very low at around 2% if they were employed in 1998 and less than 1% for those who were notPNAW workers in 1998 (Fig. 7). The fundamental problem is that very few women are employed, as a proportion of working women, in the private non-agricultural waged sector. This has been highlighted in previous studies; see for example Wahba (2009) and Assaad (2007).

Another important dimension of transition to formal PNARW in 2006 is education. Those with university degrees who were employed in 1998 with no contract had 16% probability of holding a contract in 2006 compared to around 3% among the illiterates (Fig. 8). There is clear evidence

that education affects the transition rates from informal jobs to formal ones. This is consistent with Wahba (2009) who, using evidence from the ELMPS06, and controlling for selectivity into informal jobs, finds that the mobility from informal to semi-formal/formal employment is highly segmented along education and gender. She concludes that informal employment is a stepping stone for highly educated male workers, but is a dead end for the uneducated, and for female workers.

Figure 7: Transitional Rates by Gender

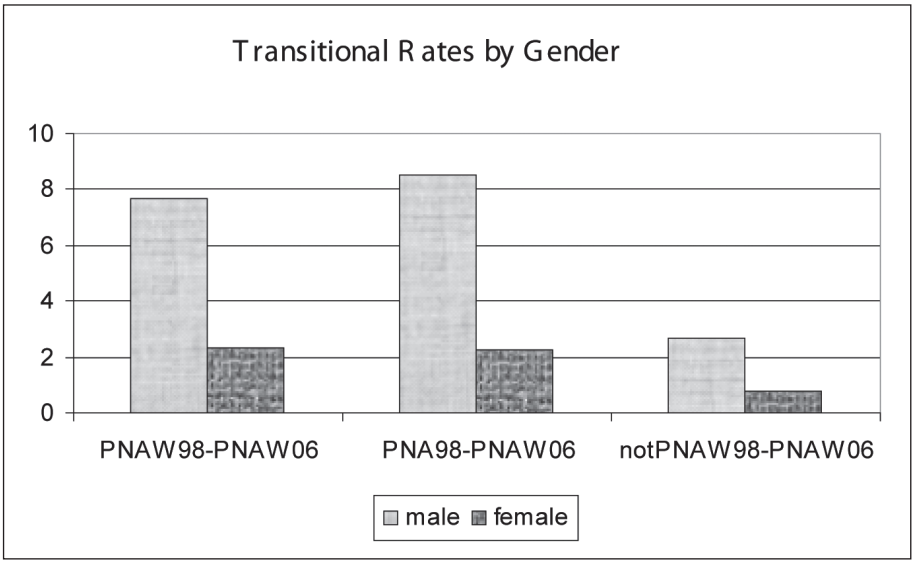
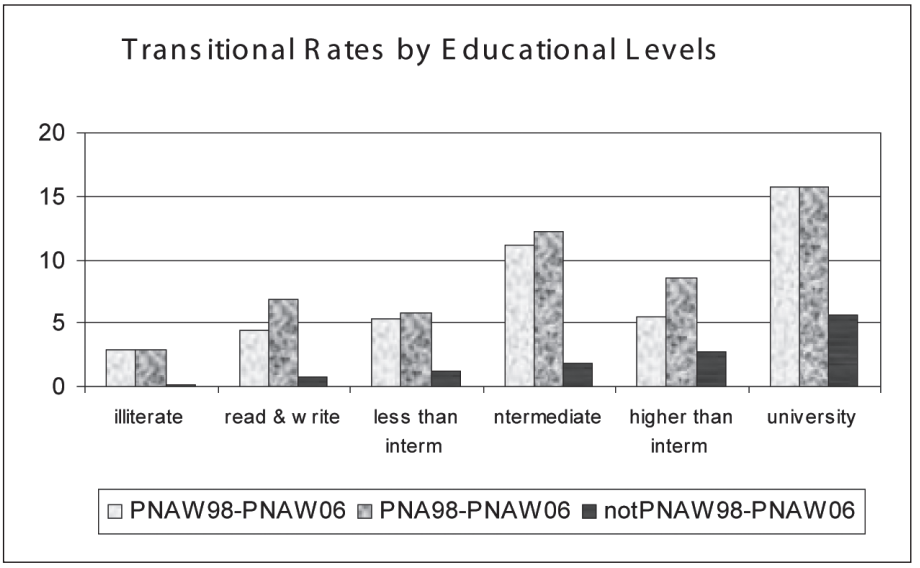


Figure 8: Transitional Rates by Educational Levels



Characteristics of Movers

Table 2 presents the characteristics of movers distinguished by their original type of employment in 1998. We study three types of workers as before who ended up in formal PNARW jobs in 2006. First, gender clearly plays an important role with the great majority of movers being males. Movers tend to be around two years younger on average to non-movers, although movers from notPNAW98 tend to be much younger than non-movers. As seen above, but here looking at the educational distribution of movers and non-movers, it is clear that movers on the whole are more educated than non-movers. Almost 58% of movers from PNAW98 or PNA98 have at least intermediate degrees. This is even more intensified among movers from not-PNAW98 were 57% have university degrees. There is also some indication that the distribution of movers is not even across regions. Looking at the region of employment in 1998, more workers move in Alexandria and the canal cities and fewer in Lower (urban and rural) Egypt. Movers also tend to have about 5 years shorter job tenures than non-movers. Examining the occupations in 1998 shows that professionals are the most likely to move, which is not surprising given that professionals tend be on average better educated. However, it has to be noted that this is not reflected for those who were notPNAW98. One has to be cautious in interpreting too much into that given that this category includes those who were not working and

therefore will not have a profession in 1998. Finally, family background does matter: movers tend to have on average better educated fathers, reflected in fewer movers having illiterate fathers. Moreover, more movers tend to have fathers who were white collar workers than non-movers.

Table 2: Movers to Formal PNARW Jobs: 1998–2006

	PNA98 & PNARW06		PNAW98 & PNARW06		notPNAW98 & PNARW06	
Variable	Movers	All	Movers	All	Movers	All
Individual Characteristics						
Male (%)	98.04	94.46	98.28	94.62	80.49	57.48
Age (in 1998)						
Age in years	26.8	28.9	27.3	29.0	24.8	33.6
20–29 old %	78.43	61.93	75.86	61.91	86.18	36.92
30–39 old %	19.61	26.14	18.97	26.11	8.13	34.04
40–49 old %	1.96	10.65	5.17	10.77	5.69	27.23
Education %						
None	7.84	22.73	6.90	22.48	1.63	31.65
Reads & writes	7.84	11.93	8.62	11.84	2.44	6.37
Less then intermediate	17.65	26.56	17.24	26.24	7.32	11.14
Intermediate	49.02	29.12	50.00	30.01	22.76	26.01
Higher than intermediate	3.92	3.84	5.17	3.90	8.13	4.83
University	13.73	5.82	12.07	5.52	57.72	20.01
Job Characteristics in 1998						
Job Region in 1998 %						
Greater Cairo	19.61	18.32	18.97	18.03	2.44	9.41
Alex.& Canal Cities	23.53	12.36	20.69	11.98	8.13	6.90
Lower Urban	11.76	17.19	10.34	16.69	3.25	11.74
Upper Urban	15.69	11.22	13.79	11.57	5.69	13.87
Lower Rural	5.88	11.79	12.07	12.65	7.32	13.54
Upper Rural	3.92	4.97	3.45	5.25	2.44	13.03
Tenure before 98 (years)	8.25	13.31	8.91	13.34	4.33	15.15

continued ▶

Occupation in 1998, %						
Legislators, senior officials & managers	3.92	0.99	5.17	2.02	1.63	7.69
Professionals	11.76	2.84	10.34	2.69	4.07	15.54
Technicians & associate professionals	1.96	2.27	1.72	2.56	2.44	9.90
Clerks	0.00	1.70	0.00	1.62	1.63	4.80
Service & shop/ market sales workers	25.49	20.03	24.14	19.38	2.44	7.46
Skilled agricultural & fishery workers	5.88	1.70	6.90	2.56	8.13	16.47
Craft & related trades workers	29.41	43.47	29.31	42.80	4.88	6.68
Plant & machine operators and assemblers	15.69	19.89	17.24	19.25	4.88	2.85
Elementary occupations	5.88	6.96	5.17	7.00	1.63	1.49
Father's characteristics %						
Illiterate	33.33	59.09	32.76	59.08	23.58	54.16
White collar	31.37	19.18	32.76	19.52	47.97	25.21

Given the different nature and patterns of first jobs, Table 3 examines that group separately. Those are the characteristics of individuals aged between 18 and 45 years of age,[4] whose first job started between 1998 and 2006. We also distinguish between all first jobs and PNAW first jobs. Comparing the characteristics of those who have had formal PNARW first jobs, similar patterns are observed as in Table 2. A couple of interesting differences are: first, those who managed to secure formal PNARW first jobs tend to be on average slightly older than those who haven't, and 37% of them tend to be located in Greater Cairo.

4 This age bracket seems to be reasonable to consider for first jobs. Including 15–18 years old distorts the results since those are least likely to have a formal job. Several sensitivity analyses were conducted using 20–45 and 18–40 age brackets and the results were robust.

Table 3: Formal PNARW First Jobs in 2006

	All First Jobs	PNAW First Jobs	Formal PNARW06
% Jobs Started 2003–05	38.49	37.35	36.80
Individual Characteristics			
Male %	70.59	76.50	77.19
Age (in years at time of LM entry)	22.15	21.94	23.23
Educational Levels %			
None	8.08	1.72	0.35
Reads & writes	1.16	0.88	0.33
Less then intermediate	5.48	4.61	4.16
Intermediate	52.67	48.62	23.56
Higher than intermediate	5.50	6.30	7.22
University	27.12	37.87	64.39
Job Regions in 1998 %			
Greater Cairo	18.86	30.63	37.14
Alex. & Canal Cities	9.92	13.19	16.65
Lower Urban	13.91	17.00	11.81
Upper Urban	13.53	17.76	25.02
Lower Rural	17.03	9.13	1.12
Upper Rural	15.97	3.17	1.55
Father's characteristics %			
White collar	26.04	30.94	49.12
Illiterate	41.25	34.22	19.24

Overall, the descriptive statistics suggest that the new labor law has had an impact on informal employment among those already employed but not among new entrants to the labor market. One potential explanation is that employers do not formalize the employment status of new workers who have just started their working careers. In the next sections, we explore the extent to which the findings so far can be attributed to the new labor law once the characteristics of individuals, jobs, and regions are controlled for.

5. Empirical Analysis: The Effect of the Labor Law

5.1 Probability of Formal Jobs and the Labor Law

First, to study the effect of the new labor law on job contract holding, the probability of workers moving to a formal (i.e. protected by job contract) PNARW job is estimated distinguishing between before and after the new law.

First, we model the probability of a worker having a formal PNARW job in 2006 not having one in 1998. Let the latent variable y* represent the decision to have a formal PNARW job. We do not observe the decision, only whether it is made or not.

$$y_{is}^{*} = X\beta + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Therefore, we define y = 1 if the worker has moved to a formal PNARW job and 0 otherwise.

$$y_{is} = 1 \quad \text{if } y^{*} > 0,$$

$$y_{is} = 0 \quad \text{if } y^{*} \leq 0$$

We assume that the disturbances are normally distributed with mean zero and unit variance and estimate the equation using probit function where X is a set of explanatory variables, β is a set of corresponding coefficients and Φ (.) is the cumulative standard distribution.

$$P(y_{is} = 1 \mid X\beta) = \Phi(X\beta)$$

The probability of a worker *i* originally in state *s* moving to a formal PNARW job in 2006 is estimated where *s* =1, 2, 3; 1= informal PNAW job in 1998; 2= informal PNA job in 1998; 3= notPNAW in 1998 (no restriction on contract in 1998 is imposed). This group, *s*=3, includes those who were not working in 1998, i.e. students, housewives, unemployed but not retired or disabled persons, agricultural workers, non-waged workers (self-employed and employers) and public sector work as long as those individuals were working in 2006 and were not originally PNAW workers in 1998.

To examine the effect of the new labor law a dummy for 2003–05 is used since the law was introduced in July 2003.[5] The public sector has played a major role in the Egyptian labor market since the 1950s with the guaranteed civil-service employment for graduates of secondary and higher educational institutions. Since 1991, the Egyptian government embarked on various economic reforms and downsizing the public sector was one of them. According to Assaad (2007) employment in state-owned enterprises (SOEs) started to decline in the 1988–98 decade, but employment in government was still growing rapidly during that period at about twice the rate of the growth of overall employment. This has changed in 1998–2006 when employment growth in the civil service has slowed dramatically. The public sector has been the preferred sector of employment for many new entrants to the labor market, particularly women. Although the government has slowed down its hiring, it is still the case that the public sector plays a major role in individuals' choices. To capture this, we use the growth in public sector employment, as a proportion of total employment, by governorate between1998–2006.[6] For individuals who were working in 1998 (s =1,2) this is based on the governorate of work location in 1998. For s =3, this is based on the governorate of residence in 1998 rather than work since this group includes individuals who were not working in 1998.

We also control for job characteristics by including years of tenure before 1998 to capture the length of work experience. Job occupation in 1998 is also included, in particular whether the worker's occupation was professional work in 1998. Given the regional variation, regional dummies are included for the six main regions in Egypt. For s=3, we control for the various "working status" in 1998 by including self employment, unpaid family work, and housewives as covariates.

Individual characteristics are also captured using male dummy, three age groups: 20–29, 30–29, and 40–49 years old. We restrict our analysis to those aged 20–50 years of age in 1998. Also, educational level is controlled for using six dummies. Finally, we control for family background, we use father's characteristics: if father is illiterate and if father was white collar worker when the individual was 15 years of age.

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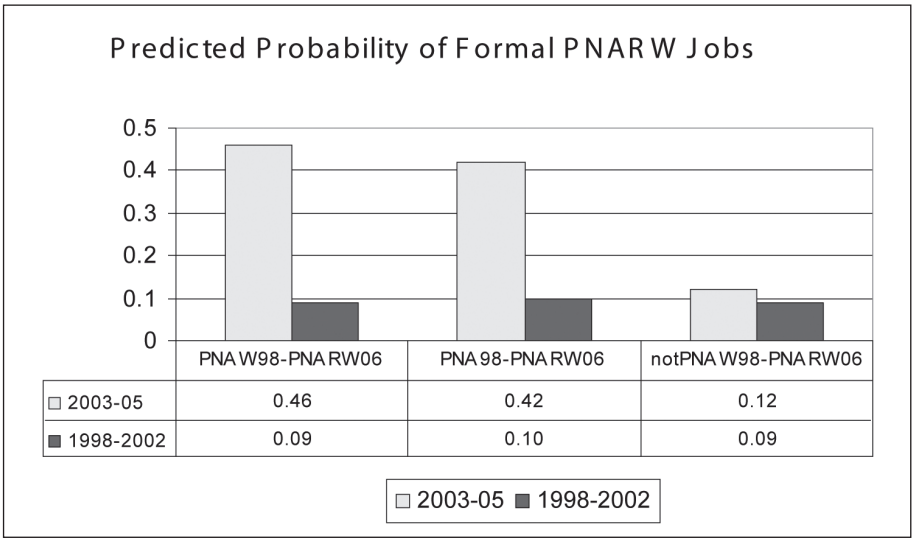
5 Jobs that started in 2006 were excluded since there are very few observations pertaining to 2006, the year of the survey. However, robustness checks were undertaken whereby including 2006 and the findings were unaltered.

6 Source: Egypt Human Development Report, various issues.

Tables A2–A5 present the marginal effects. First, the effect of the labor law on the probability of moving to formal PNARW job overall is positive and significant indicating that the new labor law has had a positive impact on formal employment. The predicted probability of moving from informal to formal PNARW has increased in 2003–05 relative to 1998–2002 as figure 9 shows. The predicted probability of an informal worker moving from PNAW employment into formal PNARW job increased from 9% to 46% after the law for a reference worker.[7] The predicted probability of an unprotected worker moving from PNA employment into protected PNARW job increased from 10% to 42% after the law for a reference worker. Finally, the predicted probability for a notPNAW in 1998 moving into formal PNARW job increased from 9% to 12% in 2003–05.[8]

Figure 9: Predicted Probability of Formal PNARW Jobs



Moving on to the other determinants of moving to protected employment, a number of factors play a significant role. First, and foremost the growth of public sector employment has a negative impact on moving into formal PNARW jobs, suggesting that workers still ranked the public sector

7 Reference person for PNA98–PNARW06 and PNAW98–PNARW06: male, 20–29 years of age, worked in Greater Cairo in 1998, father is not illiterate and is white collar worker.

8 Reference person for notPNAW98–PNARW06: male, 20–29 years of age, lives in urban areas, not self employed, not housewife, not unpaid family worker in 1998, father is not illiterate and is white collar worker.

as their preferred employment: in governorates where the public sector grew, the likelihood of workers moving into the private formal sector was lower.

As for individual characteristics, males were more likely to move to formal job. Although there was a negative relationship between age and mobility into formal jobs, this relationship was only significant for those who originated in notPNAW. The effect of education was not very strong after controlling for the public sector. Professional workers were more likely to move to protected jobs relative to other occupations. Duration of job tenure prior to 1998 seems to reduce the likelihood of moving although was not always significant. For those who were notPNAW in 1998, housewives, unpaid family workers, self-employed workers, all tend to be less likely than waged workers to move into formal employment. Family background matters: an illiterate father or a non-white collar worker reduce the probability of transition into protected jobs.[9]

The Probability of Formal PNARW First Jobs

Given our interest in the effect of the labor law on new entrants to the labor market, we examine this by estimating a binary probit model of the probability of a new entrant between 1998 and 2006 having a formal (contract) PNARW first job.

We use the same controls used above with the exception of job characteristics, which do not apply since those individuals were not working in 1998. To examine the effect of the new labor law a dummy for 2003–05 is used, but also year dummies were used, but were not significant, and are thus not reported. To capture the effect of public sector employment, the governorate of residence of the individual in 1998 is used. We limit our analysis to those aged 18–45 at the time of the first job, and use age in years at the time of first entry to the labor market.

As Table A6 shows, the labor law has had no significant impact for securing protected first jobs. In fact, the predicted probability of a formal private non-agricultural regular waged first job was around 30% before and after 2003. There is also evidence of the importance of the growth of public sector employment which has a negative impact on workers getting formal PNARW first jobs as found above. As for individual characteristics,

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9 Father's education and occupation tend to be correlated. In addition, father's education is sometimes correlated to the worker's education level. Hence the tables provide various experiments to show the potential influence of those covariates.

there is a negative relationship between age and getting a formal first job in PNARW sector. The effect of education is stronger here, with the educated being more likely to secure a protected first job relative to the uneducated.

This is consistent with section 4, where the descriptive statistics revealed that the labor law did not really affect employment of new entrants to the labor market. To analyze the effect of the labor law further, the next sub-section studies the hazard rates into formal jobs before and after the law came into effect.

5.2 Hazard Rates into PNARW

This sub-section examines the impact of the new labor law on the hazard rates of exits into formal PNARW employment. The hazard function is the product of two probabilities: the probability of receiving a job offer and the probability of accepting the job offer. We estimate a reduced form model where the total effects of the variables on exiting into protected PNARW employment is estimated rather than their separate effects on the two probabilities.[10]

Given the nature of the data, durations are grouped into a discrete time interval (years). We measure the duration from 1998 till the time of exit or till 2006 which is the time of the survey (right censored). So, we estimate the probability of exiting to protected PNARW employment in a discrete time framework. In addition, we take account of unobserved heterogeneity. Based on Jenkins (2004), we estimate by maximum likelihood a discrete time (grouped duration data) proportional hazards regression model: (1) the Prentice-Gloeckler (1978) model; and (2) the Prentice-Gloeckler (1978) model incorporating a gamma mixture distribution to summarize unobserved individual heterogeneity, as proposed by Meyer (1990). We chose a piece-wise specification to capture the effect of the labor law. We've also experimented with non-parametric specification using year dummies. For further details on the PGH models, see Jenkins (2004).

In model 1, the discrete time hazard rate for person *i* in the time interval *j* to exit to a formal PNARW employment can be written as:

$$h_j\left(X_{ij}\right) = 1 - \exp\left\{-\exp\left[X_{ij}'\beta + \theta(t)\right]\right\} \quad \text{..... (2)}$$

10 Jenkins (2004).

where X_{ij} is a set of covariates, β are the coefficients to be estimated, and $\theta(t)$ is the functional form of how the duration of the spell affects the hazard rate.

Model 2 incorporates a Gamma distributed random variable to describe unobserved (or omitted) heterogeneity between individuals. The discrete-time hazard function is:

$$h_j\left(X_{ij}\right) = 1 - \exp\left\{ -\exp\left[X_{ij}'\beta + \gamma_j + \theta(t)\right]\right\} \quad \text{..... (3)}$$

where ε is a Gamma distributed random variable with unit mean and variance $\sigma^2 \equiv v.^i$

The same covariates used before are included. To capture the effect of the new labor law, we use a dummy for 2003–05. The piece-wise constant baseline hazard specification is therefore the preferred specification for the baseline hazard estimated in this study. As before, we estimate exit from three different states: 1. the hazard rate for exit from informal PNAW to formal PNARW; 2. the hazard rate for exit from informal PNA to formal PNARW; 3. the hazard rate for exit from notPNAW to formal PNARW.

Model 2 with unobserved individual heterogeneity (frailty) was never significant, and therefore the results from model 1 only are reported below in TablesA6–A8. The figures reported are the estimated coefficients.[11] First, examining the effect of the new labor law on exits to formal PNARW employment, the evidence suggests a positive significant impact for exits from PNAW, PNA, and notPNAW. Although for exits from notPNAW, the effect is weaker once a full set of controls are used. As Table 4 shows, the hazard rate increased from around 3% to 14% for PNAW98–PNARW06. However, for notPNAW98–PNARW06, the increase was small: from only 1.7% to 3%, albeit the evidence suggests that the new labor law has had a positive and significant impact on the hazard rate of exiting into formal PNARW jobs.

In addition, the public sector plays an important role in exits to formal PNARW jobs, suggesting that to a large degree public sector employment dominates private sector ones. In fact, the findings strongly indicate that

11 Note that the proportionate impact of each variable on the state-specific hazard rate can be calculated by taking the exponent of the coefficient.

those institutional factors related to the labor law and the public sector tend to be more important than individual characteristics of workers.

Finally for new entrants, we estimate the hazard rate for a new entrant to the labor market exiting to protected PNARW job. To capture the effect of the new labor law, we use a dummy for 2003–05 and thus adopt a piece-wise constant baseline hazard specification. A number of individual, family, and regional controls are used as before.

As Table A9 shows, the new labor law has had no significant impact on formal PNARW first jobs. The hazard rate was 6.2% before the law and 5.8% after, but that difference was insignificant. However, as was evident before, the public sector plays a significant role in affecting the hazard rate of exits to formal PNARW first jobs.

Table 4: Hazard Rates of Exits to Formal PNARW Jobs (%)

	PNAW98–PNARW06	PNA98–PNARW06	notPNAW98–PNARW06	First Job: PNARW06
2003–2005	14.04	13.97	3.27	5.77*
1998–2002	3.19	3.64	1.68	6.16*

Notes: For a reference person. *Not statistically significant.

6. Conclusion

The introduction of the new labor law in 2003 provides us with an excellent opportunity to study the impact of more flexible employment protection regulations on employment. In particular, this paper examines the effect of the new labor law on formal jobs (i.e. those with contracts) in the private non-agricultural regular waged sector. The findings suggest that the new law has had a positive impact on those who were employed in 1998 in the private non-agricultural sector and in the private non-agricultural waged sector. However, the law has had no significant impact for the new entrants to the labor market. A possible explanation is that employers do not formalize the employment status of new entrants to the labor market. Another important finding is that the growth of public sector employment is an important determinant of mobility into formal private non-agricultural regular waged work. Workers in governorates with high

public sector employment growth are less likely to move into formal private non-agriculture waged employment.

The findings are encouraging: labor flexibility increases formal employment. This should encourage further reforms pertaining to the labor market to increase flexibility in the labor market such as reducing the social security contribution by employers and workers to attempt to reduce informalization and achieve decent employment. However, policymakers must recognize that labor regulation is only one part of the broader economic policy framework. Its interaction with the regulation of product markets, macroeconomic policy, and the business investment climate will determine the overall labor market performance.

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Appendix

Table A1: Moves Before and After 2003

PNAW98 to PNARW06 (%)

Year (%)	No	Yes	Total
1998–2002	94.67	5.33	100
	93.46	*66.29*	*91.47*
2003–2005	70.96	29.04	100
	6.54	*33.71*	*8.53*
Total	92.65	7.35	100
	100	*100*	*100*

PNA98 to PNARW06 (%)

Year (%)	No	Yes	Total
1998–2002	94.14	5.87	100
	92.31	*64.78*	*90.07*
2003–2005	71.13	28.87	100
	7.69	*35.22*	*9.93*
Total	91.86	8.14	100
	100	*100*	*100*

notPNAW98 to PNARW06 (%)

Year (%)	No	Yes	Total
1998–2002	97.32	2.68	100
	90.6	*67.38*	*89.77*
2003–2005	88.62	11.38	100
	9.4	*32.62*	*10.23*
Total	96.43	3.57	100
	100	100	100

Notes: In each entry, the first figure is the % of the *row*; the second figure in italics is the % in the given *column*.
PNAW98: private non-agriculture waged employment in 1998; PNA98: private non-agriculture employment in 1998; notPNAW98: not private non-agriculture waged in 1998; PNARW06: private non-agriculture regular waged in 2006.

Table A2: Probability of Holding a Job Contract in 2006: Marginal Effects
PNAW in 1998 and PNARW in 2006

	All (1)	All (2)	All (3)	Males (4)	Males (5)	Males (6)
2003–2005 dummy	0.237	0.242	0.236	0.268	0.281	0.267
	(5.53)**	(5.60)**	(5.56)**	(5.65)**	(5.77)**	(5.67)**
Public Jobs	-0.008	-0.007	-0.007	-0.008	-0.008	-0.008
	(2.47)*	(2.38)*	(2.31)*	(2.32)*	(2.29)*	(2.18)*
Individual Characteristics						
Male	0.040	0.045	0.039			
	(1.53)	(2.38)*	(1.60)			
Age (ref: 20–29 years)						
30–39 years	-0.001	-0.010	-0.004	0.002	-0.018	-0.002
	(0.06)	(0.46)	(0.19)	(0.08)	(0.95)	(0.07)
40–49 years	-0.022	-0.026	-0.022	-0.016	-0.036	-0.018
	(0.52)	(0.68)	(0.57)	(0.33)	(1.20)	(0.39)
Educational Levels (ref. None)						
Reads & writes	-0.006	-0.005	-0.010	-0.006	-0.005	-0.011
	(0.20)	(0.19)	(0.37)	(0.19)	(0.16)	(0.36)
Less than interm.	-0.013	-0.011	-0.020	-0.014	-0.007	-0.021
	(0.52)	(0.45)	(0.86)	(0.53)	(0.26)	(0.85)
Intermediate	0.007	0.007	-0.002	0.002	0.017	-0.006
	(0.26)	(0.28)	(0.07)	(0.07)	(0.61)	(0.23)
Higher than interm.	-0.010	-0.011	-0.018	-0.013	0.002	-0.020
	(0.25)	(0.27)	(0.48)	(0.30)	(0.05)	(0.50)
University	0.017	-0.024	0.001	0.026	0.003	0.009
	(0.45)	(0.73)	(0.03)	(0.60)	(0.09)	(0.25)
Job characteristics in 1998						
Tenure before '98	-0.002	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.87)	(0.59)	(0.70)	(0.97)	(0.63)	(0.79)
Professional in '98		0.220			0.161	
		(2.30)*			(1.97)*	
Job Region in 1998 (ref: Greater Cairo)						
Alex & Canal Cities	0.035	0.044	0.035	0.046	0.052	0.045
	(1.31)	(1.58)	(1.38)	(1.51)	(1.65)	(1.54)

continued ►

Lower Urban	0.012	0.020	0.013	0.017	0.023	0.018
	(0.36)	(0.58)	(0.40)	(0.47)	(0.59)	(0.49)
Upper Urban	0.027	0.034	0.033	0.031	0.036	0.037
	(0.93)	(1.14)	(1.14)	(0.96)	(1.06)	(1.14)
Lower Rural	0.001	0.008	0.007	0.001	0.005	0.007
	(0.03)	(0.21)	(0.18)	(0.03)	(0.12)	(0.16)
Upper Rural	0.048	0.056	0.060	0.054	0.058	0.066
	(0.90)	(1.02)	(1.09)	(0.93)	(0.97)	(1.12)
Father's characteristics						
White collar	0.052	0.045	0.033	0.043	0.041	0.025
	(2.44)*	(2.22)*	(1.67)	(1.97)*	(1.83)	(1.20)
Illiterate			-0.041			-0.044
			(2.23)*			(2.14)*
No of Obs.	570	570	570	533	533	533

Notes: Robust t-statistics in parentheses. * significant at 5%; ** significant at 1%

Table A3: Probability of Holding a Job Contract in 2006: Marginal Effects
PNA in 1998 and PNARW in 2006

	All	All	All	Males	Males	Males
	(1)	(2)	(3)	(4)	(5)	(6)
2003–2005 dummy	0.212	0.215	0.208	0.239	0.249	0.235
	(5.39)**	(5.47)**	(5.39)**	(5.54)**	(5.65)**	(5.55)**
Public Jobs	-0.008	-0.008	-0.008	-0.008	-0.009	-0.008
	(2.61)**	(2.53)*	(2.53)*	(2.48)*	(2.47)*	(2.41)*
Individual Characteristics						
Male	0.047	0.051	0.045			
	(1.69)	(2.53)*	(1.76)			
Age (ref: 20–29 years)						
30–39 years	0.005	-0.005	0.002	0.010	-0.016	0.006
	(0.20)	(0.20)	(0.07)	(0.36)	(0.83)	(0.21)
40–49 years	0.000	-0.007	-0.005	0.012	-0.026	0.004
	(0.00)	(0.16)	(0.12)	(0.21)	(0.82)	(0.07)

continued ►

Educational Levels (ref. None)

Reads & writes	0.010	0.010	0.004	0.011	0.011	0.004
	(0.32)	(0.31)	(0.12)	(0.30)	(0.31)	(0.12)
Less than interm.	-0.009	-0.007	-0.017	-0.010	-0.001	-0.019
	(0.30)	(0.25)	(0.66)	(0.33)	(0.04)	(0.68)
Intermediate	0.022	0.022	0.010	0.018	0.039	0.006
	(0.73)	(0.74)	(0.36)	(0.54)	(1.21)	(0.20)
Higher than interm.	0.025	0.025	0.008	0.024	0.061	0.008
	(0.48)	(0.48)	(0.18)	(0.43)	(0.98)	(0.16)
University	0.032	-0.018	0.011	0.042	0.022	0.021
	(0.73)	(0.48)	(0.30)	(0.85)	(0.46)	(0.48)

Job characteristics in 1998

Tenure before '98	-0.002	-0.001	-0.002	-0.003		-0.002
	(1.07)	(0.80)	(0.91)	(1.19)		(1.02)
Professional in '98	0.213			0.159		
	(2.22)*			(1.91)		

Job Regions in 1998 (ref: Greater Cairo)

Alex. & Canal Cities	0.028	0.036	0.028	0.037	0.042	0.035
	(1.01)	(1.26)	(1.04)	(1.17)	(1.29)	(1.18)
Lower Urban	0.008	0.015	0.009	0.013	0.017	0.014
	(0.24)	(0.43)	(0.28)	(0.35)	(0.45)	(0.38)
Upper Urban	0.013	0.019	0.020	0.016	0.020	0.023
	(0.45)	(0.64)	(0.68)	(0.51)	(0.59)	(0.71)
Lower Rural	0.044	0.051	0.050	0.050	0.055	0.057
	(1.18)	(1.36)	(1.31)	(1.22)	(1.30)	(1.34)
Upper Rural	0.030	0.034	0.039	0.034	0.032	0.044
	(0.56)	(0.64)	(0.72)	(0.59)	(0.56)	(0.75)

Father's characteristics

White collar	0.059	0.053	0.040	0.051	0.050	0.032
	(2.66)**	(2.47)*	(1.90)	(2.23)*	(2.12)*	(1.47)
Illiterate			-0.042			-0.045
			(2.27)*			(2.21)*
No of Obs.	603	603	603	565	565	565

Notes: Robust t-statistics in parentheses. * significant at 5%; ** significant at 1%

Table A4: Probability of Holding a Job Contract in 2006: Marginal Effects notPNAW in 1998 and PNARW in 2006

	All	All	All	All
	(1)	(2)	(3)	(4)
2003–2005 dummy	0.009	0.008	0.004	0.004
	(2.50)*	(2.43)*	(1.40)	(1.45)
Public Jobs	-0.001	-0.001	-0.001	-0.001
	(5.00)**	(4.89)**	(4.41)**	(3.23)**
Individual Characteristics				
Male	0.004	0.004	0.004	0.004
	(1.96))*	(1.99)*	(1.88)	(1.94)*
Age (ref: 20–29 years)				
30–39 years	-0.018	-0.017	-0.011	-0.011
	(6.06)**	(6.08)**	(4.07)**	(4.04)**
40–49 years	-0.012	-0.012	-0.005	-0.004
	(5.21)**	(5.23)**	(1.84)	(1.33)
Educational Levels (ref.: None)				
Reads & writes	0.005	0.005	0.005	
	(0.45)	(0.43)	(0.50)	
Less than interm.	0.013	0.011	0.010	
	(1.36)	(1.20)	(1.20)	
Intermediate	0.012	0.009	0.008	
	(1.62)	(1.31)	(1.31)	
Higher than interm.	0.023	0.018	0.018	0.003
	(1.91)	(1.63)	(1.84)	(0.71)
University	0.029	0.023	0.029	0.004
	(3.03)**	(2.57)*	(3.35)**	(1.97)*
Job characteristics in 1998				
Tenure before '98			-0.0004	-0.0004
			(2.66)**	(3.01)**
Professional in '98			-0.010	
			(5.21)**	
Self employed in '98				-0.005
				(1.55)
Unpaid worker in '98				0.005

continued ►

				(1.05)
Housewife in '98				-0.006
				(1.63)
Urban	-0.006	-0.006	-0.004	-0.004
	(2.23)*	(2.14)*	(1.72)	(1.70)
Father's characteristics				
White collar	0.004	0.002	0.003	0.005
	(1.81)	(1.18)	(1.72)	(2.29) *
Illiterate		-0.004		
		(1.73)		
No. of Obs.	3880	3880	3880	3880

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

Table A5: Probability of Holding a Job Contract in 2006: Marginal Effects notPNAW in 1998 and PNARW in 2006: Males

	Males	Males	Males	Males
	(1)	(2)	(3)	(4)
2003–2005 dummy	0.012	0.009	0.010	0.010
	(2.20)*	(1.77)	(2.11)*	(1.54)
Public Jobs	-0.002	-0.001	-0.001	-0.001
	(4.05)**	(3.71)**	(3.96)**	(3.44)**
Individual Characteristics				
Age				
30–39 years	-0.014	-0.013	-0.014	-0.012
	(3.36)**	(3.11)**	(3.39)**	(3.13)**
40–49 years	-0.001	-0.003	-0.002	-0.003
	(0.24)	(0.53)	(0.36)	(0.66)
Educational Levels (ref.: None)				
Reads & writes			0.013	
			(0.67)	
Less than interm.	0.007	0.008	0.011	
	(0.67)	(0.80)	(0.81)	
Intermediate	0.005	0.008	0.007	

continued ►

	(0.57)	(0.98)	(0.64)	
Higher than interm.	0.008	0.017	0.011	0.004
	(0.74)	(1.34)	(0.79)	(0.78)
University	0.015	0.032	0.016	0.013
	(1.53)	(2.79)**	(1.31)	(3.49)**
Job characteristics in 1998				
Tenure before '98	-0.001	-0.001	-0.001	-0.001
	(2.95)**	(2.55)*	(2.87)**	(2.46)**
Professional in '98		-0.013		-0.011
		(4.36)**		(4.18)**
Self employed in '98				-0.007
				(1.73)
Unpaid worker in '98				0.0001
				(0.04)
Urban	-0.006	-0.005	-0.005	-0.004
	(1.59)	(1.31)	(1.44)	(1.30)
Father's characteristics				
White collar	0.007	0.006	0.004	0.004
	(1.98)*	(1.89)	(1.34)	(1.43)
Illiterate			-0.007	-0.007
			(1.99)*	(2.09)*
No. of Obs.	2709	2709	2709	2709

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

Table A6: Probability of First Job with Contract in 2006: Marginal Effects (PNARW in 2006)

	All	All	Males	Males
	(1)	(2)	(3)	(4)
2003–2005 dummy	-0.011	-0.011	-0.017	-0.017
	(0.96)	(0.98)	(1.16)	(1.17)
Public Jobs	-0.008	-0.008	-0.007	-0.007
	(3.95)**	(3.92)**	(3.03)**	(3.02)**
Individual Characteristics				
Male	0.004	0.006		
	(0.31)	(0.48)		
Age	0.003	0.003	0.013	0.012
	(2.25)*	(2.08)*	(4.70)**	(4.66)**
Educational Levels (ref. None)				
Reads & writes	0.158	0.140		
	(1.09)	(1.03)		
Less than interm.	0.272	0.245	0.079	0.074
	(2.32)*	(2.17)*	(0.75)	(0.71)
Intermediate	0.118	0.105	0.023	0.022
	(1.89)	(1.71)	(0.33)	(0.30)
Higher than interm.	0.348	0.294	0.098	0.093
	(2.73)**	(2.43)*	(0.94)	(0.90)
University	0.357	0.307	0.113	0.108
	(3.60)**	(3.21)**	(1.28)	(1.22)
Job Region (ref: Greater Cairo)				
Alex. & Canal Cities	0.008	0.009	0.016	0.016
	(0.51)	(0.55)	(0.74)	(0.72)
Lower Urban	-0.004	-0.004	0.000	0.000
	(0.22)	(0.18)	(0.01)	(0.00)
Upper Urban	0.021	0.021	0.045	0.045
	(1.19)	(1.20)	(2.02)*	(2.02)*
Lower Rural	-0.076	-0.073	-0.091	-0.091
	(3.73)**	(3.63)**	(2.82)**	(2.81)**
Upper Rural	-0.076	-0.073	-0.068	-0.068
	(3.82)**	(3.67)**	(2.97)**	(2.92)**

continued ▶

Father's characteristics

White collar		0.018	0.012	0.009
		(1.43)	(0.78)	(0.58)
Illiterate		-0.023		-0.010
		(1.70)		(0.56)
No. of Obs.	1666	1666	1145	1145

Notes. Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

Table A7: Hazard Rate of Holding a Job Contract in 2006: Males

	PNAW98 - PNAW06				PNA98 - PNAW06			
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
2003–2005 dummy	1.839	5.49	1.859	5.5	1.715	5.4	1.715	5.36
Public Jobs	-0.169	-2.14	-0.174	-2.16	-0.146	-2.19	-0.148	-2.16
Individual Characteristics								
Age (ref: 20–29 years)								
30–39 years	0.111	0.2	-0.043	-0.08	0.211	0.41	0.099	0.19
40–49 years	-15.813	-0.01	-15.984	-0.01	-0.658	-0.52	-0.914	-0.72
Educational Level (ref: none)								
Reads and writes	0.191	0.23	-0.025	-0.03	0.621	0.81	0.429	0.55
Less than interm.	-0.143	-0.2	-0.312	-0.42	0.129	0.18	-0.086	-0.12
Intermediate	0.165	0.23	0.009	0.01	0.559	0.8	0.364	0.51
Higher than interm.	-0.182	-0.17	-0.372	-0.35	0.562	0.6	0.317	0.33
University	0.407	0.47	0.222	0.25	0.733	0.87	0.522	0.61
Job Region in 1998 (ref: Greater Cairo)								
Alex & Canal Cities	0.788	1.78	0.902	2.02	0.663	1.55	0.745	1.73
Lower Urban	0.411	0.62	0.557	0.81	0.199	0.32	0.297	0.47
Upper Urban	0.607	1.18	0.772	1.46	0.297	0.61	0.451	0.91
Lower Rural	0.321	0.39	0.519	0.63	0.805	1.35	0.921	1.53
Upper Rural	-0.323	-0.3	0.030	0.03	-0.495	-0.46	-0.249	-0.23

continued ►

Job characteristics in 1998

Tenure before '98	-0.042	-1.00	-0.030	-0.72	-0.046	-1.13	-0.037	-0.91

Father's characteristics

White collar	0.693	1.83	0.461	1.16	0.700	2.04	0.460	1.28
Illiterate			-0.816	-2.20			-0.755	-2.17
Constant	-8.109	-4.54	-7.827	-4.29	-7.912	-5.14	-7.492	-4.78

person-years	4091	4091	4326	4326
Log Likelihood	-194.69	-192.17	-220.30	-217.87

Table A8: Hazard Rate of Holding a Job Contract in 2006
notPNAW in 1998 and PNARW in 2006

	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
2003–2005 dummy	0.410	1.68	0.191	0.78	0.459	1.71	0.270	1.00
Public Jobs	-0.129	-4.35	-0.122	-3.98	-0.127	-3.83	-0.122	-3.58

Individual Characteristics

Male	0.587	2.18	0.401	1.46				
Age								
30–39 years	-1.859	-3.32	-1.771	-3.07	-1.530	-2.33	-1.499	-2.24
40–49 years	-0.423	-0.64	-0.658	-0.93	0.408	0.5	0.006	0.01

Educational Levels

Read & write	1.058	0.75	0.770	0.54				
Less than interm.	1.252	1.13	0.985	0.88				
Intermediate	1.258	1.21	1.070	1.01				
Higher than interm.	1.520	1.41	1.481	1.34	0.321	0.72	0.458	1.02
University	1.790	1.74	1.861	1.73	0.547	1.86	0.816	2.6
Urban	-0.791	-2.47	-0.685	-2.11	-0.711	-2.11	-0.618	-1.82

continued ▶

Job characteristics in 1998

Tenure before '98	-0.104	-3.61	-0.078	-2.64	-0.128	-3.59	-0.096	-2.8
Professional '98			-2.225	-4.26			-1.861	-3.54
Self employed '98			-0.896	-1.49			-0.787	-1.3
Unpaid '98			-0.049	-0.11			-0.077	-0.16
Housewife '98			-1.180	-1.12				

Father's characteristics

White collar	0.403	1.84	0.293	1.28	0.469	1.94	0.329	1.31
Illiterate			-0.396	-1.33			-0.527	-1.57
Constant	-7.953	-6.45	-7.318	-5.68	-6.215	-7.53	-5.982	-7.11

person-year	30547	30547	21272	21272
Log likelihood	-524.12	-504.583	-418.674	-406.262

Table A9: Hazard Rate of First Job with Contract in 2006 (PNARW in 2006)

	All				Males			
	(1)		(2)		(3)		(4)	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
2003–2005 dummy	-0.150	-1.04	-0.142	-0.99	-0.164	-0.96	-0.161	-0.94
Public Jobs	-0.081	-2.65	-0.080	-2.64	-0.069	-2.05	-0.069	-2.05

Individual Characteristics

Male	-0.008	-0.05	-0.011	-0.07				
Age	-0.139	-5.96	-0.137	-5.9	-0.078	-2.45	-0.078	-2.44
Education								
Less than interm	1.538	1.97	1.646	2.12				
Intermediate	1.018	1.37	1.127	1.52				
Higher than interm	1.539	2.00	1.665	2.17	0.450	1.37	0.458	1.40
University	1.735	2.36	1.881	2.58	0.556	2.66	0.570	2.75

continued ▶

Job Region in 98 (ref. Greater Cairo)

Alex., Canal Cities	0.025	0.13	0.034	0.18	0.083	0.37	0.087	0.39
Lower Urban	-0.153	-0.57	-0.155	-0.57	-0.161	-0.51	-0.159	-0.5
Upper Urban	0.160	0.8	0.153	0.77	0.322	1.44	0.322	1.44
Lower Rural	-1.970	-3.25	-2.014	-3.32	-2.775	-2.71	-2.788	-2.73
Upper Rural	-1.809	-2.98	-1.859	-3.07	-1.371	-2.24	-1.384	-2.26

Father's characteristics

White collar	0.171	1.12	0.235	1.6	0.110	0.62	0.132	0.77
Illiterate	-0.291	-1.48			-0.094	-0.43		
Constant	-2.694	-2.35	-2.945	-2.61	-2.820	-2.84	-2.876	-2.93
person-year		7102		7102		3811		3811
Log likelihood		-821.448		-822.594		-597.764		-597.859